

# ARITHMETIC BY PRACTICE

FIFTH YEAR - FIRST HALF

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GORTON - LYNCH - MURRAY

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# ARITHMETIC BY PRACTICE

*FIFTH YEAR—FIRST HALF*

BY

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## PREFACE

THIS series of arithmetics has been prepared by the authors to cover certain essential requirements in the teaching of arithmetic.

To secure efficiency in arithmetic it is necessary:

*First.* That pupils have a thorough knowledge of the fundamental processes.

*Second.* That the formal facts of arithmetic, such as the multiplication tables, denominate number tables, and the ordinary factors be thoroughly memorized.

*Third.* That processes should be made as simple and concise as possible.

*Fourth.* That immediate application be made of what has been taught in variety and in amount sufficient to fix the process.

*Fifth.* That continual review be provided in order that the pupil shall retain what he has learned.

It is this plan which has been carefully carried out in preparing the present series of books. Each written lesson is preceded by an oral lesson as a preparation for the work which is to follow; and each new problem is explained in a type lesson, which contains sufficient application to fix the type.

The arrangement of the material in four lessons followed by a review, with a week of review each fourth week, is made in order that the teacher shall follow up the work, week by week and month by month. In this way a teacher may discover the points which need further intensive drill.

It is not intended that the teacher shall feel bound to accomplish all the work laid out in each lesson in a recitation period. The part of the lesson which is not completed should be assigned for home work. If the lessons are used in the order of their arrangement, the new work will be found in the early part of the lesson, and when this is completed the remaining time should be given to such part of the review work of the lesson as needs special drill. If a class masters the type quickly, then part of the new work may be omitted and more time given to the review.

Since many teachers prefer to review particular types topically, an index in the back of the book shows in what lessons the particular topics are to be found. This index shows that the greater part of the time is given to the new work of the grade, but that there is a complete review of the work of all the preceding grades.

The amount of review work in the upper grades is so great that it is not possible to include a large number of problems of each kind in the review; but the important types of the preceding grades have been placed in the back of each book, where they may be used by the pupils who

have difficulty in the solution of problems belonging to the review types.

Drill sheets in all operations have been included. They will be found of value in fixing arithmetical facts and operations, and in securing speed and accuracy. These drills should be used daily, preceding the oral work.

In preparing the problems, care has been taken to avoid impractical and unbusinesslike situations, and to utilize the ordinary arithmetical language of business.

The series is the result of a careful study of classroom conditions by the authors, who have had many years of experience in the teaching of arithmetic; it is their hope and belief that herein teachers and pupils will find present arithmetical difficulties materially reduced.

The authors wish to express their sincere thanks to all their fellow-teachers who by counsel, by assisting in the selection or preparation of problems, and by their helpful and constructive criticisms, have aided so generously in the preparation of the work.



# ARITHMETIC BY PRACTICE

## FIFTH YEAR—FIRST HALF

### TERM PLAN

#### NEW

1. Prime Factors. (Type I.)
2. Use of Combinations of Numbers for Rapid Addition. (Type II.)
3. Finding L. C. M. of Two or More Numbers. (Type III.)
4. Least Common Multiple.

#### REVIEW

Addition and Subtraction of Mixed Numbers. Multiplication. Fractional Part.  
Prime Factors. Area. Multiplication. Addition and Subtraction of Mixed Numbers.  
Prime Factors. Division. Addition. Addition and Subtraction of Mixed Numbers.  
Addition and Subtraction of Fractions. Multiplication. Division. Addition.

### REVIEW I

5. Least Common Multiple.
6. Multiplication of Whole Number by Fraction and Fraction by Whole Number. (Type IV.)

Mixed Numbers. Division. Change. Area. Prime Factors. Addition.  
L. C. M. Area. Cancellation. Addition of Mixed Numbers.

NEW	REVIEW
7. Multiplication of Whole Numbers by Fractions.	Factoring. L. C. M. Problem with Two Operations. Mixed Numbers. Fractional Part. Addition.
8. Division, with Remainder Expressed as a Fraction. (Type V.)	Area. Square Measure. Long Measure. Fractional Parts. Factoring. Dozen. Change.

## REVIEW II

9. Division.	Mixed Numbers to Fractions and Fractions to Mixed Numbers. Addition and Subtraction of Fractions. Multiplication. Division. Problem L. C. M.
10. Multiplication of Whole Numbers by Mixed Numbers. (Type VI.)	Mixed Numbers. Area. Division Problems. Addition and Subtraction of Fractions. Two Operations.
11. Multiplication by Mixed Numbers.	Mixed Numbers. Reduction to Mixed Numbers. Reduction of Fractions. Addition. Two Operations.
12. Cancellation. (Type VII.)	Division. Multiplication. Mixed Numbers. Addition of Mixed Numbers. Two Operations. Addition.

## REVIEW III

## REVIEW A

NEW	REVIEW
13. Cancellation.	Notation. Reduction. Subtraction. Change. Area. Square Measure.
14. Multiplication of a Fraction by a Fraction. (Type VIII.) Teach that $16\frac{1}{2}$ ft. = 1 rod.	Addition. Roman Numerals. Long and Avoirdupois Measures. Numeration.
15. Multiplication of Fractions.	Notation. Division. Cancellation. Addition and Subtraction of Fractions. Long Measure.
16. <i>Mixed Numbers</i> Multiplication of a Mixed Number by a Fraction. (Type IX.)	Bill. Subtraction of Mixed Numbers. Liquid Measure. Fractional Part. Subtraction.

## REVIEW IV

17. Multiplication of a Mixed Number by a Fraction.	Problem. Notation. Addition. Subtraction. Long Measure. Multiplication of Fractions. Division.
18. Multiplication of a Mixed Number by a Mixed Number. (Type X.)	Time. Reduction. Long and Square Measures. Division. Fractional Part.
19. Multiplication of Mixed Numbers.	Problems with Mixed Numbers.
20. Mixed Numbers.	Area. Liquid and Square Measures. Roman Numerals. Dry Measure. Two Operations.

## REVIEW V

NEW	REVIEW
21. Mixed Numbers. Teach Average.	Cancellation. Dry Measure. Multiplication. Addition. Subtraction of Mixed Numbers.
22. Problem, Cost of One and Gain or Loss on All Given to Find Selling Price of One. (Type XI.)	Mixed Numbers. Addition. Roman Numerals.
23. Problems.	Gain or Loss to Find Selling Price. Cancellation. Addition. Mixed Numbers. Average. Two Operations.
24. Problems.	Cancellation. Fractional Parts. Area. Liquid Measure. Avoirdupois Weight. Mixed Numbers.

## REVIEW VI

## REVIEW B

25. Problem. To Find What Part One Number Is of Another. (Type XII.)	Notation and Addition. Multiplication. Subtraction and Addition of Mixed Numbers.
26. Problem in Fractions.	Long Measure. Two Operations. Liquid Measure. Cancellation. Addition and Subtraction of Fractions.
27. Problems in Fractions.	Mixed Numbers. Gain and Loss. Area. Square Measure.
28. Problems in Fractions.	Addition. Area. Square Measure. Long and Dry Measures.

## REVIEW VII

## NEW

29. Problem. To Find What Fractional Part a Fraction Is of an Integer. (Type XIII.)

30. Problems in Fractions.

31. To Find What Part a Mixed Number Is of a Whole Number. (Type XIV.)

32. Problems in Mixed Numbers.

## REVIEW

Square Measure. Fractional Parts. Average. Roman Numerals. Dry Measure. Gain and Loss.

Dry Measure. Mixed Numbers.

Dozen. Area. Cancellation. Division. Gain and Loss.

Cancellation. Avoirdupois Weight. Multiplication. Division.

## REVIEW VIII

33. To Find Area in Acres. (Type XV.)

Teach that  $160 \text{ sq. rd.} = 1 \text{ A.}$

34. Areas. Acres.

35. Areas. Acres.

36. Areas. Acres.

Fractional Parts. Long and Dry Measures.

Mixed Numbers. Average. Fractional Parts.

Reduction of Fractions. Gain or Loss. Factoring. Fractional Parts. Mixed Numbers.

Long and Liquid Measure. Roman Numerals. Two Operations. Cancellation. Fractional Parts.

## REVIEW IX

## REVIEW C

## NEW

37. Perimeters of Squares and Rectangles. (Type XVI.)
38. Perimeters.
39. Perimeters.
40. Long Measure Problems.

## REVIEW

Time. Mixed Numbers. Cancellation.

Long Measure. Problems with Fractions. Notation. Factoring. Addition. Square Measure.

Avoirdupois, Dry, Square and Long Measures. Area. Multiplication. Problems. Subtraction. Fractional Part.

Area. Mixed Numbers. Addition. Square Measure. Division. Problems. Roman Numerals.

## REVIEW X

41. Reduction of Two Denominate Units. (Type XVII.)
42. Reduction of Two Denominate Units.
43. Use of Parenthesis. Relative Value of Signs. (Type XVIII.)
44. Use of Parenthesis.

Liquid and Long Measures. Fractional Parts. Problems. Perimeters.

Avoirdupois. Perimeter. Dry Measure. Division. Mixed Numbers. Addition.

Roman Numerals. Long and Dry Measures. Reduction of Improper Fractions. Perimeters. Reduction of Two Denominate Units.

Perimeter. Notation. Area. Multiplication. Reduction of Two Denominate Units. Long and Square Measures. Mixed Numbers. Fractional Parts.

## REVIEW XI

NEW	REVIEW
45. Bills. (Type XIX.)	Long Measure and Avoirdupois Weight. Denominate Numbers. Time. Perimeter. Cancellation.
46. Bills.	Cancellation. Dry Measure. Dozen. Addition. Multiplication. Square Measure. Reduction of Improper Fractions and Denominate Units.
47. Bill and Receipt. (Type XX.)	Long and Dry Measures. Dozen. Area. Addition, Subtraction and Multiplication of Fractions. Roman Numerals.
48. Bills and Receipts.	Area. Square, Dry and Liquid Measures. Addition. Division. Parenthesis. Cancellation.

## REVIEW XII

## REVIEW D

49. Bills and Receipts.	Area. Square Measure. Addition. Factoring. Fractions. Parenthesis. Mixed Numbers.
50. Problems.	L. C. M. Fractions. Roman Numerals. Liquid Measure. Bill. Cancellation. Time. Mixed Numbers.

## NEW

51. Problems.

52. Problems.

## REVIEW

Dry and Long Measures. Addition. Perimeter. Fractional Parts. Subtraction. Average. Mixed Numbers. Multiplication.

Area. Parenthesis. Change. Mixed Numbers. Dozen. Roman Numerals. Fractional Parts. Long Measure. Reduction of Improper Fractions. Bill and Receipt. Av-  
oirdupois.

## REVIEW XIII

53. Problems.

54. Problems.

55. Problems.

56. Problems.

Area. Square Measure. Mixed Numbers. Parenthesis. Factoring. Addition. Fractional Parts.

Perimeter. Long and Dry Measures. Cancellation. Average. L. C. M. Fractions. Area.

Av-  
oirdupois Weight. Cancellation. Long and Liquid Measures. Division. Roman Numerals. Perimeter. Area. Fractions.

Liquid, Long, Dry and Square Measures. Perimeter. Cancellation. Parenthesis. Mixed Numbers.

## REVIEW XIV

## NEW

57. Problems.

58. Problems.

59. Problems.

60. Problems.

## REVIEW

Fractions. Parenthesis. Notation. Time. Roman Numerals. Addition. Mixed Numbers.

Liquid and Dry Measures. Dozen. Avoirdupois. Factoring. Area. Fractional Parts. Mixed Numbers.

Fractions. Bill and Receipt. Area. Square and Long Measures. Perimeter. Parenthesis. Multiplication. Division.

Long and Dry Measures. Avoirdupois Weight. Area. Dozen. Notation. Cancellation.

## REVIEW XV

## REVIEW E

## TYPE I

*Teach that a **prime number** is a number that cannot be exactly divided by any number except itself and one.*

*The **prime factors** of a number are the prime numbers which multiplied together will give the number.*

1. 2 and 3 are the prime factors of 6.
2. 2, 2, and 3 are the prime factors of 12.
3. 2, 3, and 5 are the prime factors of 30.
4. 3 and 7 are the prime factors of 21.
5. Find the prime factors of 24:

Dividing 24 by the prime factor 2 gives 12 as a quotient.

$$\begin{array}{r} 2 \overline{)24} \end{array}$$

Dividing 12 by the prime factor 2 gives 6 as a quotient.

$$\begin{array}{r} 2 \overline{)12} \end{array}$$

6 as a quotient.

$$\begin{array}{r} 2 \overline{)6} \end{array}$$

Dividing 6 by the prime factor 2 gives

$$\begin{array}{r} 3 \overline{)3} \end{array}$$

3 as a quotient.

$$\begin{array}{r} 1 \end{array}$$

Dividing 3 by the prime factor 3 gives 1 as a quotient.

Therefore 2, 2, 2, and 3 are the prime factors of 24.

6. Find the prime factors of 110.

$$\begin{array}{r} 2 \overline{)110} \end{array}$$

Proceeding as in problem 5, we find that 2, 5, and 11 are the prime factors of 110.

$$\begin{array}{r} 5 \overline{)55} \end{array}$$

$$\begin{array}{r} 11 \overline{)11} \end{array}$$

$$\begin{array}{r} 1 \end{array}$$

7. What are the prime factors of 84?

TYPE I—*Continued*

8. What are the prime factors of 462?
9. Separate 156 into its prime factors.
10. What prime numbers multiplied together will give a product of 432?

RULE: *Divide the given number by any prime factor.  
Divide the succeeding quotients by any prime factor, until  
the final quotient is 1.*

*The divisors are the prime factors of the number.*

## LESSON 1

## ORAL

1. What are the prime factors of 27?
2. What is the sum of all the odd numbers less than 10?
3.  $2\frac{1}{2} + 2\frac{3}{4} = ?$
4. From  $3\frac{3}{4}$  take  $1\frac{1}{3}$ .
5. What is  $\frac{4}{5}$  of 40?
6. At \$1.25 each, what is the cost of 2 umbrellas?

## WRITTEN

1. Find the prime factors of 576.
2. Find the prime factors of 264.
3. Find the prime factors of 216.
4. Find the prime factors of 360.
5. Find the prime factors of 540.
6. Add  $12\frac{2}{3}$ ,  $16\frac{1}{2}$ , 19, and  $27\frac{5}{6}$ .
7. From  $96\frac{3}{8}$  take  $27\frac{3}{7}$ .
8. From  $42\frac{5}{12}$  take  $29\frac{4}{9}$ .
9. A contractor used 406 bbl. of cement in building the foundation for a factory. At \$2.45 per barrel, how much did the cement cost?
10. An auto cost \$1500. A horse cost  $\frac{2}{5}$  as much. What was the cost of the horse?

## TYPE II

*Teach pupils to write numbers of 3 periods.*

*Rapid Addition by Combination of Numbers Whose Sum is 10 or Less, in Column Addition.*

1. Add	4 2 6 7 9 3 6	4 } 9	2 } 9	6 } 10	7 } 9	etc.
	5 7 4 2 1 6 3	5 } 9	7 } 9	4 } 10	2 } 9	
	8 9 3 7 8 4 2	8 } 9	9 }	3 } 9	7 } 9	
	1 0 6 2 1 5 4	1 } 9	0 }	6 }	2 }	
	8 5 3 7 9 2		8	5	3	
	<hr style="width: 100%;"/>					

NOTE: If the numbers are coupled where the sums are ten or less, the combinations will result in more rapid work, since practice will train the pupil to think one number when the two are taken together, instead of making each addition separately.

The above example will appear as:

9	9	10	9	10	9	9
9	9	9	9	9	9	6
8	5	3	7	9	2	
<hr style="width: 100%;"/>						
20	8	6	3	8	8	7

NOTE: After pupils easily combine consecutive numbers, they should be trained to combine **any** two or more numbers whose sum is ten or less, whether consecutive or not.

TYPE II—*Continued*

Add by coupling:

2. 4,014,967	3. 1,708,659
475,133	371,442
5,590,864	635,087
5,317,226	98,741
731,475	201,238
<hr/>	<hr/>

4. 832,579	5. 3,275,196
268,143	4,723,714
900,756	8,396,437
827,432	604,652
1,382,587	2,729,396
4,539,113	4,187,532
<hr/>	<hr/>

6. 435,672	7. 362,745
563,428	635,251
638,259	853,768
351,540	975,325
938,251	628,694
<hr/>	<hr/>

8. 4,674,298	9. 5,497,293
3,569,354	3,243,576
8,364,736	8,453,978
2,547,388	1,453,243
9,773,852	9,867,576
1,355,247	6,465,978
<hr/>	<hr/>

## LESSON 2

NOTE TO THE TEACHER: *In all column addition, the teacher should see that the pupils combine addends to 10 whenever possible, and add as one number.*

## ORAL

1. What are the prime factors of 50?
2. How many square inches in your paper if it is 9 in. long and 6 in. wide?
3. Add  $\frac{2}{3}$  and  $\frac{3}{4}$ .
4. From  $6\frac{1}{2}$  take  $4\frac{1}{3}$ .
5. Find the cost of 8 things at \$1.06 each.
6. Minuend 7, subtrahend  $5\frac{2}{5}$ . Find the remainder.

## WRITTEN

1. 4,032,967	2. 253,748
567,143	1,456,361
3,305,496	787,584
182,314	21,415
817,205	256,814
<hr/>	<hr/>
	23,195

3. Find the prime factors of 875.
4. Find the prime factors of 270.
5. Find the prime factors of 990.
6. Find the prime factors of 4680.
7. Find the number of square feet there are in a floor that is 28 ft. long and 16 ft. wide.
8. Add  $205\frac{2}{3}$ ,  $67\frac{1}{4}$ ,  $129\frac{1}{8}$ .
9. From  $216\frac{3}{4}$  take  $127\frac{5}{7}$ .
10. Find the cost of 807 bbl. of flour at \$5.62 per barrel.

## TYPE III

## TO FIND THE L. C. M. OF TWO OR MORE NUMBERS

1. Find the L. C. M. of 8, 9, 12, and 21.

$$\begin{array}{r}
 2 \overline{)8, 9, 12, 21} \\
 3 \overline{)4, 9, 6, 21} \\
 2 \overline{)4, 3, 2, 7} \\
 2, 3, 1, 7
 \end{array}$$

---


$$2 \times 3 \times 2 \times 2 \times 3 \times 7 = 504$$

*Ans.*

(a) Find a prime factor of two or more of the given numbers. 2 is a factor of 8 and 12.

(b) Divide 8 and 12 by 2 and write the quotients underneath—2 is not a factor of 9 or 21, so we bring down 9 and 21 without dividing them.

(c) 3 is a factor of 9, 6, and 21. Divide 9, 6, and 21 by 3.

3 is not a factor of 4, so we bring down 4 without dividing it.

(d) 2 is a factor of 4 and 2. Divide 4 and 2 by 2. Bring down 3 and 7.

(e) 2, 3 and 7 are prime numbers, so they have no factors.

The L. C. M. of 2 or more numbers is the product of all the prime factors that are common to two or more of the numbers, and of the final quotients. As,  $2 \times 3 \times 2 \times 2 \times 3 \times 7 = 504$ . L. C. M.

**RULE:** Write all the numbers given in a line. Divide by any common prime factor of two or more of the numbers, bringing down the quotients and any number not divisible.

TYPE III—*Continued*

*Continue the division by a common prime factor of two or more of the numbers until the final quotients are prime numbers.*

*The product of the divisors and the final quotients is the L. C. M. of the numbers.*

2. Find the L. C. M. of 12, 30, and 45.
3. Find the L. C. M. of 8, 12, 20, and 21.
4. Find the L. C. M. of 45, 54, 90, and 135.
5. What is the shortest piece of wire that can be cut evenly into lengths of either 8, 12, or 15 ft.?
6. Find the smallest number of quarts of milk that can be exactly contained in either 2, 4, 5, 6, or 9 quart cans.
7. Find the L. C. M. of the denominators of the fractions  $\frac{17}{24}$ ,  $\frac{11}{32}$ ,  $\frac{15}{36}$ , and  $\frac{43}{45}$ .

## LESSON 3

## ORAL

1. What is the least number that will exactly contain 3, 6, and 9?
2. Find the L. C. M. of 3, 8, and 6.
3. What are the prime factors of 36?
4. From 12 take  $8\frac{3}{7}$ .
5. Add  $\frac{1}{2}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and  $\frac{3}{4}$ .
6. If 7 sleds cost \$7.70, what will 1 sled cost?

## WRITTEN

1. What is the least common multiple of 16, 24, and 40?
2. Find the L. C. M. of 20, 24, 10, and 15.
3. Find the L. C. M. of 8, 18, 24, 36, 40.
4. Find the L. C. M. of 48, 16, 20.
5. What is the smallest number that is exactly divisible by 55, 10, 33, 11?
6.  $809,746 + 381,295 + 528,934 + 864,163 + 235,695 = ?$
7.  $597,638 + 306,371 + 4,983,594 + 8,018,915 + 31,043 = ?$
8. From 200 take  $146\frac{6}{7}$ .
9. Add  $20\frac{3}{5}$ ,  $42\frac{1}{2}$ ,  $14\frac{1}{4}$ , and  $67\frac{3}{10}$ .
10. The value of 845 tons of coal was \$6,337.50. What was 1 ton worth?

## LESSON 4

## ORAL

1. What is the L. C. M. of 5, 10, and 6?
2. Add  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{2}{3}$ ,  $\frac{3}{4}$ , and  $\frac{1}{2}$ .
3. A man had \$10 and spent  $\$3\frac{7}{10}$ . How much has he left?
4. How many hours in 2 days?
5.  $35 \times 5 = ?$
6. If a man walks 4 mi. per hour, how long will it take him to walk 100 mi.?

## WRITTEN

1. Find the L. C. M. of 40, 12, 15, 4, and 8.
2. Find the L. C. M. of 10, 16, 40, 45, 27.
3. Add  $\frac{1}{2}$ ,  $\frac{3}{8}$ ,  $\frac{1}{6}$ ,  $\frac{3}{4}$ , and  $\frac{2}{3}$ .
4. From 210 take  $47\frac{5}{12}$ .
5. A man owning  $546\frac{7}{10}$  A. of land sold  $279\frac{3}{4}$  A. How many acres had he remaining?
6. I spent  $\$27\frac{1}{2}$ ,  $\$18\frac{3}{4}$ ,  $\$32\frac{5}{10}$ ,  $\$12\frac{1}{5}$ . How much did I spend in all?
7. A locomotive travels 480 mi. in 24 hr. It traveled 408 hr. before being taken to the shops for repairs. How many miles did it travel?
8. A glove factory produces 275 pairs of gloves daily. How many pairs will it produce in 450 da.?
9. If a factory makes 275 pairs of shoes daily, how long will it take to manufacture 83,875 pairs?
10. Add
 

846,254
2,249,765
7,174,839
9,946,132
<u>1,034,646</u>

## REVIEW I

1. Find the L. C. M. of 18, 24, 25, 30.
2. Add  $21\frac{1}{2}$ ,  $87\frac{3}{4}$ ,  $58\frac{5}{8}$ , and  $46\frac{4}{5}$ .
3. Subtract  $48\frac{2}{3}$  from  $92\frac{5}{8}$ .
4. How many square feet are there in a field 98 ft. long and 45 ft. wide?
5. A man had \$413.17 in the bank. He drew out \$78.75. How much remained in the bank?
6. Find a multiple of 13 between the numbers 140 and 150.
7. Add  $\frac{5}{6}$  of 576 and  $\frac{7}{8}$  of 344.
8. Add the prime numbers from 11 to 19 inclusive.
9. A merchant's receipts for 187 days were \$12,629.98. How much was that per day?
10. Add
 

3,605,338
2,194,691
7,936,476
851,313
1,220,948
<hr/>

## ADDITION DRILL I

*Add each column down and then across.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(10)	8	7	9	6	4	5	3	2	7
(11)	1	3	1	4	5	4	7	8	2
(12)	9	8	6	7	4	5	3	8	6
(13)	7	3	9	6	8	9	7	5	4
(14)	3	6	2	8	7	1	2	3	9
(15)	4	9	3	7	9	6	8	7	5
(16)	6	2	7	3	1	4	9	3	9
(17)	7	8	9	6	3	4	5	1	2
(18)	9	7	8	6	4	5	2	1	3
(19)	1	3	4	2	6	7	5	8	9
(20)	3	8	7	9	8	8	6	7	5
(21)	9	3	7	8	6	4	2	7	8
(22)	7	8	9	6	7	8	4	9	3
(23)	5	2	1	7	3	2	8	4	7
(24)	7	9	4	8	3	8	4	6	9

## MULTIPLICATION DRILL

<i>A</i>	<i>B</i>	<i>C</i>
103,069 ×15 <hr/>	48,527 ×19 <hr/>	310,079 ×22 <hr/>
82,304 ×13 <hr/>	120,903 ×14 <hr/>	37,005 ×21 <hr/>
42,067 ×25 <hr/>	70,531 ×23 <hr/>	390,642 ×16 <hr/>
138,462 ×18 <hr/>	53,071 ×24 <hr/>	112,253 ×17 <hr/>
301,122 ×21 <hr/>	42,903 ×18 <hr/>	65,308 ×14 <hr/>
47,092 ×15 <hr/>	36,521 ×23 <hr/>	465,003 ×19 <hr/>
82,105 ×24 <hr/>	19,362 ×16 <hr/>	40,731 ×13 <hr/>
60,539 ×22 <hr/>	74,207 ×17 <hr/>	<hr/>

## LESSON 5

## ORAL

1. What is the smallest number that will contain 8 and 12 without a remainder?
2. Add  $2\frac{1}{2}$  and  $3\frac{1}{3}$ .
3. From  $6\frac{1}{5}$  take  $4\frac{1}{10}$ .
4.  $30 - 19 - 6 = ?$
5. Divide 390 by 10.
6. I buy 3 lb. of sugar @ 6¢ a pound. What change do I receive from a quarter of a dollar?

## WRITTEN

1. Find the L. C. M. of 35, 21, 66, 55.
2. Add  $\$16\frac{3}{5}$ ,  $\$18\frac{1}{10}$ ,  $\$9\frac{1}{25}$ ,  $\$5\frac{3}{4}$ .
3. From  $\$67\frac{7}{7}$  subtract  $\$24\frac{1}{8}$ .
4. What is the area in square yards of a field which is 216 ft. long and 904 ft. wide?
5.  $48,040 \div 40 = ?$
6. I had  $\$40\frac{1}{2}$  and spent  $\$16\frac{5}{10}$  and  $\$18\frac{1}{4}$ . How much had I left?
7. A grain dealer sold  $\$72\frac{3}{5}$  worth of corn,  $\$60\frac{8}{10}$  worth of oats,  $\$97\frac{1}{5}$  worth of wheat. What was the amount of his sales?
8. Find the prime factors of 360.
9. I bought 26 chairs @ 85¢ each. What change will I receive from \$25?
10. Add
 

998,877	
2,665,544	
332,211	
6,223,344	
1,078,656	

## TYPE IV

(A) To find the product of a whole number and a fraction.

1. A boy walks 20 mi. in 1 day. How far will he walk in  $\frac{3}{7}$  of a day?

$$20 \text{ mi.} \times \frac{3}{7} = \frac{60}{7} \text{ mi.} = 8\frac{4}{7} \text{ mi.}$$

(B) To multiply a fraction by a whole number.

2. If it takes  $\frac{7}{8}$  of a pound of wool to make a scarf, how many pounds are needed for 50 scarfs?

$$\frac{7}{8} \text{ lb.} \times 50 = \left( \frac{7 \times 50}{8} \right) = \frac{350}{8} \text{ lb.} = 43\frac{6}{8} \text{ lb.} = 43\frac{3}{4} \text{ lb.}$$

**RULE:** *To find the product of a fraction and a whole number, multiply the numerator of the fraction by the whole number, and place the product over the denominator.*

*If possible, reduce the fraction to a simpler form.*

3. How many pounds of candy are there in 26 boxes if each box weighs  $\frac{3}{4}$  lb.?

4. If John spends  $\$ \frac{4}{5}$  per day for carfare and lunch, what will he spend in 15 da.?

5. A man bought 120 yd. of lace @  $\$ \frac{3}{4}$  per yard. What did it cost him?

6. How many yards of cloth are needed to cover 30 books if each book requires  $\frac{5}{8}$  yd.?

## LESSON 6

## ORAL

1. How much is 4 times  $\frac{2}{3}$ ?
2. Multiply 8 by  $\frac{3}{4}$ , or find  $\frac{3}{4}$  of 8.
3. What is the L. C. M. of 7, 5, and 10?
4. What is the area of a card 3 in. by 4 in.?
5.  $\frac{4 \times 5}{10} = ?$
6. Add  $3\frac{1}{5}$  and  $\frac{7}{10}$ .

## WRITTEN

1.  $420 \times \frac{2}{3} = ?$
2.  $\frac{4}{5} \times 144 = ?$
3. Multiply 109 by  $\frac{5}{9}$ .
4. What is  $\frac{5}{12}$  of 48?
5. Take  $\frac{7}{18}$  of 321.
6. What is the L. C. M. of 20, 24, 33?
7. What is the smallest number that I can exactly divide by 18, 28, and 20?
8. How many square yards of carpet are needed for a floor 18 ft. long and 12 ft. wide?
9.  $\frac{48 \times 108}{16 \times 12} = ?$
10. What is the sum of  $16\frac{1}{6}$ ,  $4\frac{3}{2}$  and  $18\frac{1}{8}$ ?

## LESSON 7

## ORAL

1.  $20 \times \frac{4}{5} = ?$
2. What is the cost of  $\frac{5}{8}$  lb. of meat @ \$.24 a pound?
3. What are the prime factors of 60?
4. A man had \$8. He spent  $\$2\frac{1}{2}$  and  $\$4\frac{1}{4}$ . How much money had he left?
5. What is the L. C. M. of 3, 4, 5, and 6?
6. If 2 articles cost 18¢, what will 7 articles cost?

## WRITTEN

1.  $289 \times \frac{9}{17} = ?$
2. Land cost \$140 an acre. What is  $\frac{2}{5}$  of an acre worth?
3. If 1 lamb chop weighs  $\frac{3}{8}$  lb., what will 19 chops weigh?
4. Mr. B. raised 320 bu. of potatoes. Mr. F. raised  $\frac{5}{11}$  as much. How many bushels did Mr. F. raise?
5. Find the prime factors of 960.
6.  $3,605,338 + 2,194,681 + 936,476 + 851,313 + 1,220,948 = ?$
7. The L. C. M. of 32, 5, 8, and 40 is what?
8. From a piece of cloth containing 40 yd. there were cut  $6\frac{5}{8}$  yd.,  $4\frac{1}{3}$  yd., and  $3\frac{2}{9}$  yd. How many yards were left?
9. A tub of butter weighs  $27\frac{3}{16}$  lb. The tub weighs  $4\frac{5}{8}$  lb. What is the weight of the butter?
10. It takes 312 links to make 13 chains. How many links are needed for 18 chains?

## TYPE V

DIVISION BY A WHOLE NUMBER, WITH THE REMAINDER  
EXPRESSED AS A FRACTION

1. Divide 329 by 34.

$$(A) \quad \begin{array}{r} 9\frac{23}{34} \text{ Ans.} \\ 34 \overline{)329} \\ \underline{306} \\ 23 \end{array}$$

34 is contained into 329 nine times.  $9 \times 34 = 306$ . The remainder is 23.

Write the remainder 23 as the numerator, the divisor 34 as the denominator of a fraction, thus,  $\frac{23}{34}$ , and add it to the quotient, (9), giving the answer  $9\frac{23}{34}$ .

2.  $117 \div 29 = ?$

3.  $368 \div 17 = ?$

4. Find the quotient of 973 divided by 939.

NOTE: *Reduce the fractional remainder to lowest terms when possible.*

5. Divide 152 by 32.

$$\begin{array}{r} 4\frac{3}{4} \text{ Ans.} \\ 32 \overline{)152} \\ \underline{128} \\ 24 \end{array}$$

$$24 = \frac{24}{1} = \frac{24 \div 8}{1 \div 8} = \frac{3}{\frac{1}{8}} = 3\frac{3}{8}$$

6.  $6942 \div 16 = ?$

7.  $45,348 \div 108 = ?$

8. What is the quotient of 4217 divided by 68?

## LESSON 8

## ORAL

1. Divide 37 by 5.
2. How many 9's are there in 70?
3. What is the area of a desk top 2 ft. wide and 3 ft. long?
4. How many rods are there in a mile?
5. Find  $\frac{4}{5}$  of 35.
6. What is the cost of 2 doz. apples @ 1¢ each?

## WRITTEN

1. Divide 4863 by 28.
2.  $24,095 \div 207 = ?$
3.  $\frac{14049}{45} = ?$
4.  $\frac{56406}{204} = ?$
5. How many square inches are there in a sheet of zinc 2 ft. long and  $1\frac{1}{2}$  ft. wide?
6. Reduce  $\frac{4}{15}$  of a mile to rods.
7. Take  $\frac{8}{9}$  of 7652.
8. What are the prime factors of 700?
9. Bought 4 doz. books @ 16¢ each. What was the cost?
10. Bought 30 doz. pads at 4¢ each. What was the change from a twenty-dollar bill?

## REVIEW II

1. Name two factors which make 84. Name the 4 prime factors of 84.

2. Find the L. C. M. of 9, 12, 15, and 20.

3. Add  $37\frac{2}{3}$ ,  $42\frac{6}{7}$ , and  $38\frac{1}{2}$ .

4. Subtract  $64\frac{4}{5}$  from 113.

5. A plumber used  $3\frac{1}{2}$  lb. of solder one day,  $7\frac{1}{8}$  lb. the second,  $4\frac{3}{4}$  lb. the next, and  $2\frac{3}{8}$  lb. the next. He had  $20\frac{1}{2}$  lb. in stock. How many pounds had he left?

6. A contractor sodded a park 140 ft. long and 108 ft. wide. The contract price was 65¢ a square yard. How much was the bill?

7. In blasting rock for a cellar, the contractor estimated that there were 36,960 cu. ft. of stone. His buckets can lift 1800 lb. to a load. How many bucket loads were there? (1 cubic foot of stone weighed 300 lb.) (Cancellation.)

8. What is the combined weight of 6 cases of cereal, each case containing 48 boxes, and each box weighing  $\frac{1}{8}$  of a pound?

9. A man walks  $\frac{1}{4}$  of a mile in 10 min. How far can he walk in an hour?

10. I paid \$24.30 for 3 cases of eggs, each containing 30 dozen. How much were the eggs worth per dozen?

## MULTIPLICATION DRILL

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
7285 <u>×147</u>	6879 <u>×897</u>	2798 <u>×987</u>	4859 <u>×978</u>	6598 <u>×875</u>	7289 <u>×157</u>
9306 <u>×258</u>	7789 <u>×798</u>	3987 <u>×789</u>	8967 <u>×689</u>	4398 <u>×785</u>	8279 <u>×248</u>
4178 <u>×369</u>	8987 <u>×709</u>	8974 <u>×897</u>	6985 <u>×869</u>	5697 <u>×875</u>	3978 <u>×358</u>
7285 <u>×258</u>	9798 <u>807</u>	5987 <u>×978</u>	6948 <u>×968</u>	5684 <u>×758</u>	9748 <u>469</u>
9306 <u>×369</u>	1897 <u>×708</u>	9786 <u>×897</u>	5986 <u>×698</u>	6587 <u>×857</u>	8759 <u>×546</u>
4178 <u>×417</u>	7528 <u>×741</u>	9787 <u>×798</u>	4958 <u>×896</u>	8769 <u>×587</u>	9867 <u>×673</u>
7825 <u>×267</u>	9603 <u>×285</u>	8797 <u>×709</u>	5968 <u>×986</u>	9847 <u>×679</u>	7918 <u>×765</u>
7825 <u>×639</u>	8714 <u>×396</u>	9879 <u>×708</u>	9687 <u>×687</u>	6598 <u>×976</u>	8279 <u>×847</u>
9063 <u>×714</u>	5827 <u>×528</u>	1978 <u>×807</u>	5987 <u>×876</u>	6589 <u>×769</u>	8937 <u>×945</u>
4781 <u>×582</u>	6903 <u>×936</u>	9786 <u>×987</u>	3987 <u>×768</u>	5489 <u>×697</u>	7948 <u>×165</u>
2978 <u>×789</u>	8174 <u>×471</u>	6978 <u>×879</u>	6857 <u>×678</u>	5478 <u>×967</u>	7598 <u>×267</u>

## LESSON 9

## ORAL

1. How many 8's in 77?
2. If 4 pieces of ribbon contain 39 yd., what is the average length of each piece?
3. Change  $9\frac{5}{7}$  to an improper fraction.
4. Reduce  $\frac{100}{8}$  to a mixed number.
5. What is the smallest number that will exactly contain 6 and 8?
6. From 59 take the sum of 13 and 17.

## WRITTEN

1. Divide 24,816 by 144.
2. 2097 lb. of turkeys were shipped in 36 bbl. What was the average weight of each barrel?
3. Change  $45\frac{5}{22}$ ,  $16\frac{5}{12}$  to improper fractions.
4. Change  $\frac{2468}{17}$ ,  $\frac{452}{14}$  to mixed numbers.
5.  $38\frac{7}{8} + 46\frac{7}{12} + 18\frac{7}{9} + 60\frac{7}{18}$  equals what?
6. A book contains 288 pages. On each page there are 809 letters. How many letters are there in the book?
7. What was the length of one piece of goods, if 579 pieces measured 36,477 yd?
8. What number can be divided exactly by all of the following: 24, 9, 6, 21, 14, 3?
9. From  $69\frac{1}{2}$  take  $17\frac{5}{12} + 18\frac{1}{3}$ .
10. I bought 1260 lb. of wheat at 90¢ a bushel. What did it cost if 1 bu. of wheat weighs 60 lb.?

## TYPE VI

## TO FIND THE PRODUCT OF A WHOLE NUMBER AND A MIXED NUMBER

(A) *When the Fraction in the Mixed Number has 1 for its Numerator.*

1. One yard of velvet cost \$.36. What will  $6\frac{1}{4}$  yd. cost?

$\begin{array}{r} 9 \\ 36 \end{array} \times \frac{1}{4} = \frac{9}{4}$	$\begin{array}{r} \text{\$.36} \\ \times 6\frac{1}{4} \\ \hline 9 \\ 216 \\ \hline \text{\$2.25} \end{array}$	<p>(a) First, multiply by the fraction. (<math>36 \times \frac{1}{4} = 9</math>).          Write 9 as the first partial product.          (b) Multiply by 6 the whole number in the multiplier, writing the first figure of the product under 9.          (c) Add the products (9 and 216).</p>
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2. Multiply 36 by  $5\frac{1}{9}$ .      3.  $7\frac{1}{3} \times 12 = ?$   
 4. Find the product of 108 and  $9\frac{1}{12}$ .  
 5. Find the product of 7 and  $4\frac{1}{8}$ .  
 6. Multiply 12 by  $3\frac{1}{4}$ .

(B) *When the Numerator of the Fraction is more than 1.*

$\begin{array}{r} 7 \\ 24 \end{array} \times 2\frac{2}{3} = ?$	$\begin{array}{r} 24 \\ \times 2\frac{2}{3} \\ \hline 16 \\ 48 \\ \hline 64 \end{array}$	<p>(a) Multiply 24 by <math>\frac{2}{3}</math>.          (b) Multiply 24 by 2.          (c) Add the products.</p>
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64    *Ans.*

8. At \$.76 per bushel, what will  $19\frac{3}{4}$  bu. cost?

9. A man carted 24 loads of gravel in one day. How many loads can he cart in  $24\frac{5}{8}$  days?

10. A train travels 35 mi. per hour. How far will it go in  $18\frac{2}{5}$  hours?

## LESSON 10

## ORAL

1.  $15 \times 1\frac{1}{3} = ?$
2. Find  $\frac{3}{4}$  of 48.
3. Add  $2\frac{3}{5}$  and  $4\frac{3}{5}$ .
4. How many square feet in a board 6 ft. long and  $1\frac{1}{2}$  ft. wide?
5. If a man walks 36 mi. in 12 hr., how far does he walk in one hour?
6. If \$20 will buy 4 chairs, what will 6 chairs cost?

## WRITTEN

1.  $14 \times 2\frac{1}{7} = ?$
2.  $48 \times 5\frac{1}{8} = ?$
3.  $420 \times 6\frac{3}{14} = ?$
4.  $180 \times 20\frac{5}{9} = ?$
5. Find the product of 5280 and  $120\frac{1}{2}$ .
6. A sailing vessel travels  $126\frac{4}{15}$  mi. the first day,  $174\frac{8}{21}$  mi. the second day, and  $142\frac{5}{6}$  mi. the third day. How far has it traveled in all?
7. A man owes  $\$1265\frac{5}{10}$ . He pays back  $\$597\frac{1}{20}$ . How much does he still owe?
8. How many square feet are there in a floor 28 ft. long and  $19\frac{3}{4}$  ft. wide?
9. Divide 33,487,320 by 895.
10. If 13 cords of wood cost \$52, what will  $17\frac{5}{8}$  cords cost?

## LESSON 11

## ORAL

1. What is the cost of 2 cans of syrup each containing 4 qt. at 10¢ a quart?
2.  $8 \times 2\frac{3}{4} = ?$
3. If a boy earns  $\$ \frac{1}{2}$  a day for 10 days, how much more must he earn in order to have \$8?
4. Reduce  $11\frac{4}{5}$  to fifths.
5. What mixed number is equal to  $\frac{70}{6}$ ?
6. Reduce  $\frac{24}{36}$  to lowest terms.

## WRITTEN

1.  $384 \times 31\frac{5}{8} = ?$
2. What is the cost of 4 bbl. of molasses, each containing 48 gal., @  $65\frac{1}{2}$ ¢ a gallon?
3. A man agrees to walk 2000 mi. in a certain time. If he walks  $27\frac{9}{31}$  mi. a day for 62 days, how many more miles does he still have to travel?
4. A man owned 3 fields. The first contained  $21\frac{3}{4}$  A., the second  $27\frac{2}{3}$  A., the third  $28\frac{9}{10}$  A. How many acres in all did he own?
5. Mr. Jones has  $10\frac{1}{2}$  A. of wheat,  $6\frac{3}{8}$  A. of corn,  $20\frac{5}{6}$  A. of barley, and  $16\frac{3}{5}$  A. of rye. How many acres of grain has he?
6. (a) Change to an improper fraction  $92\frac{3}{14}$ .  
(b) Change to a mixed number  $\frac{8657}{8}$ .

LESSON 11—*Continued*

7. Reduce to lowest terms  $\frac{25}{55}$ ,  $\frac{90}{150}$ ,  $\frac{60}{95}$ .

8. Change  $\frac{5}{6}$  to 36ths.

9. Add 418,625

736,491

5,258,057

845,361

3,927,209

693,584

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10. From a barrel containing  $47\frac{3}{4}$  gal., there were drawn  $14\frac{3}{8}$  gal. and  $22\frac{1}{3}$  gal. How many gallons were left?

## TYPE VII

## (CANCELLATION)

WHERE THE NUMERATOR DOES NOT CONTAIN ALL THE FACTORS OF THE DENOMINATOR

Teach (a), that all remaining factors in the numerator must be multiplied together.

(b) That all the remaining factors in the denominator must be multiplied together.

(c) That the resulting products are to be written as a fraction which should be changed to its simplest form.

$$1. \frac{4 \times 6 \times 9 \times 5}{10 \times 15 \times 3 \times 2} = ?$$

$$\frac{\overset{2}{\cancel{4}} \times \overset{3}{\cancel{9}} \times \overset{3}{\cancel{5}}}{\underset{2}{\cancel{10}} \times \underset{5}{\cancel{15}} \times \cancel{3} \times \cancel{2}} = \frac{6}{5} = 1\frac{1}{5}. \quad \text{The answer is } \frac{6}{5} \text{ or } 1\frac{1}{5}.$$

$$2. \frac{3 \times 12 \times 8 \times 16}{4 \times 9 \times 6 \times 4} = ?$$

$$3. \frac{12 \times 16 \times 15 \times 24}{5 \times 9 \times 8 \times 18 \times 14 \times 3} = ?$$

$$4. \frac{22 \times 24 \times 18 \times 36}{8 \times 3 \times 9 \times 11 \times 48} = ?$$

$$5. \frac{12 \times 8 \times 16 \times 24 \times 36}{48 \times 9 \times 4 \times 6 \times 3 \times 6} = ?$$

## LESSON 12

## ORAL

1.  $\frac{10 \times 4}{5 \times 2} = ?$
2. If 12 lb. of rice cost \$1.08, what is the cost of 6 lb.?
3.  $\frac{9}{10} \times 110 = ?$
4. If I spend  $\$2\frac{1}{2}$  and  $\$1\frac{3}{4}$ , how much have I left from \$5?
5. At \$3.03 each, what will 4 articles cost?
6. Add 14, 17, and 39.

## WRITTEN

1.  $\frac{11 \times 39 \times 15 \times 96}{44 \times 18 \times 26 \times 14} = ?$
2.  $\frac{25 \times 160 \times 13 \times 90}{51 \times 30 \times 8 \times 15} = ?$
3.  $\frac{54 \times 3 \times 4 \times 15}{18 \times 12 \times 10} = ?$
4.  $\frac{12 \times 126 \times 19 \times 7 \times 24}{28 \times 57 \times 21 \times 18 \times 5} = ?$
5. If a factory furnace consumes 121,980 bu. of coal in 285 days, how many bushels will it consume in 1 day?
6.  $49\frac{8}{15} \times 4965 = ?$
7.  $12\frac{5}{14} + 16\frac{4}{9} + 22\frac{1}{2} + 14\frac{1}{7} = ?$
8. Mr. Jones earns  $\$60\frac{1}{2}$  a week. He spends  $\$6\frac{1}{4}$ ,  $\$8\frac{1}{2}$ ,  $\$14\frac{2}{5}$ ,  $\$4\frac{1}{20}$  and  $\$9\frac{1}{50}$ . How much has he left?
9. A letter carrier walks  $9\frac{6}{7}$  mi. per day. How far will he walk in 27 days?
10. Add 396,785; 2,643,210; 4,285,657; 340,102; 4,578,569; 5,210,043.

## REVIEW III

1. Divide 237,589 by 486.
2. Change  $18\frac{11}{7}$ ,  $24\frac{9}{13}$ , and  $4\frac{7}{11}$  to improper fractions.
3. A broker was given \$25,000 with which to purchase bonds selling at \$98 each. How many did he buy, and how much money had he left over?
4. A certain book contains 412 pages. The average number of lines per page was 26. How many lines are there in twelve such books?
5. What number can be exactly divided by 18, 12, 9, and 16?
6. A merchant sold  $24\frac{1}{2}$  yd.,  $18\frac{5}{8}$  yd., and  $12\frac{5}{8}$  yd. of gingham. If he had in stock  $75\frac{1}{2}$  yd., how many yards had he left?
7. A sheet of paper used to cover a geography measures 12 in. by 26 in. How many square inches of paper are needed for 50 covers?
8. What is the product of  $27\frac{1}{19}$  and 76?
9. How many square yards are there in the floor of a room 16 ft. long and 12 ft. wide?
10. Reduce to lowest terms  $\frac{84}{128}$ ,  $\frac{57}{95}$ , and  $\frac{88}{143}$ .

## DIVISION DRILL

*A*

$$12 \overline{)398,448}$$

$$13 \overline{)56,277}$$

$$14 \overline{)732,074}$$

$$15 \overline{)730,365}$$

$$16 \overline{)1,095,024}$$

$$17 \overline{)212,041}$$

$$18 \overline{)100,728}$$

$$19 \overline{)237,025}$$

$$21 \overline{)390,054}$$

$$22 \overline{)13,354,682}$$

$$23 \overline{)485,208}$$

$$24 \overline{)1,922,328}$$

$$25 \overline{)150,625}$$

*B*

$$13 \overline{)3,992,677}$$

$$17 \overline{)700,485}$$

$$15 \overline{)1,245,975}$$

$$19 \overline{)2,338,729}$$

$$12 \overline{)860,508}$$

$$14 \overline{)100,366}$$

$$15 \overline{)3,107,520}$$

$$18 \overline{)890,370}$$

$$16 \overline{)2,093,056}$$

$$25 \overline{)319,075}$$

$$23 \overline{)493,005}$$

$$24 \overline{)2,708,472}$$

$$25 \overline{)3,750,925}$$

## RAPID FACTOR DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Start and stop at the teacher's signal. Write for 5 minutes. Score 5 for each correct answer. Keep a record of results and compare with subsequent trials. Note improvement in speed and accuracy.*

A	B	C	D
$121 \div 11 = ?$	$\begin{array}{r} ? \overline{)91} \\ 7 \end{array}$	$? \div 5 = 11$	$\frac{1}{3}$ of $93 = ?$
$72 \div 6 = ?$		$69 \div 3 = ?$	$? \times 6 = 66$
$? \times 12 = 144$	$19 \times 4 = ?$	$\begin{array}{r} 2 \overline{)86} \\ ? \end{array}$	$\frac{1}{8}$ of $78 = ?$
$\frac{1}{5}$ of $81 = ?$	$\begin{array}{r} 4 \overline{) ?} \\ 13 \end{array}$	$? \div 3 = 19$	$94 \div ? = 2$
$54 \div ? = 6$	$? \div 2 = 41$	$\frac{1}{7}$ of $70 = ?$	$17 \times ? = 68$
$4 \times ? = 36$	$90 \div 9 = ?$	$\begin{array}{r} ? \overline{)80} \\ 10 \end{array}$	
$\begin{array}{r} ? \overline{)96} \\ 8 \end{array}$	$\begin{array}{r} 7 \overline{)98} \\ ? \end{array}$	$? \times 2 = 58$	$19 \times 5 = ?$
$12 \times 7 = ?$	$? \times 9 = 99$	$37 \times ? = 74$	$\begin{array}{r} 6 \overline{) ?} \\ 8 \end{array}$
$\begin{array}{r} 7 \overline{) ?} \\ 9 \end{array}$	$\frac{1}{4}$ of $100 = ?$	$\begin{array}{r} ? \overline{)88} \\ 8 \end{array}$	$121 \div ? = 11$
$? \div 7 = 7$	$110 \div 10 = ?$	$31 \times 2 = ?$	$\begin{array}{r} ? \overline{)72} \\ 9 \end{array}$
$64 \div 8 = ?$	$120 \div ? = 10$	$\begin{array}{r} 3 \overline{) ?} \\ 25 \end{array}$	$12 \overline{) ?}$
$\begin{array}{r} 7 \overline{)56} \\ ? \end{array}$	$\begin{array}{r} ? \overline{)51} \\ 17 \end{array}$	$? \div 2 = 46$	$12$
$? \times 6 = 42$	$5 \times 12 = ?$	$65 \div 5 = ?$	$9 \times ? = 81$
$\frac{1}{11}$ of $132 = ?$	$\begin{array}{r} 5 \overline{) ?} \\ 17 \end{array}$	$\begin{array}{r} 7 \overline{)77} \\ ? \end{array}$	
$108 \div ? = 9$			

## REVIEW A

1. Find the prime factors of 840.
2. Add  $36\frac{2}{3}$ ,  $48\frac{3}{4}$ ,  $97\frac{5}{8}$ ,  $83\frac{4}{5}$ , and  $75\frac{1}{2}$ .
3. From  $42\frac{5}{12}$  take  $29\frac{11}{16}$ .
4. The fare from B to M was \$2.67. The train carried 289 passengers. What was the total amount of their fares?
5. Add  $\frac{3}{4}$  of 352 and  $\frac{5}{6}$  of 372.
6. What is the area in square feet of a floor 16 ft. long and 15 ft. wide?
7. Add 65,984; 347,978; 58,976; 593,874; 179,658; 9786.
8. Divide forty-three million by 684.
9. What is the smallest number that can be exactly divided by 4, 5, 6, 7, and 8?
10. A merchant's bill for 158 waists was \$611.46. What was the price of each?
11. A man had \$314.27 on deposit in the bank. How much will he have left when he has drawn out \$75 and \$87.75?
12. Into how many pieces, each containing 16 sq. in., can I cut a piece of cardboard 32 in. by 36 in.?
13. At 30¢ a pound, what will be the cost of 48 boxes of candy, each containing  $\frac{3}{4}$  of a pound?
14. How many square yards are there on a floor 51 ft. long and 42 ft. wide?
15. 
$$\frac{39 \times 121 \times 63}{44 \times 91 \times 99} = ?$$

REVIEW A—*Continued.*

16. A stationer bought 15 doz. blank books for \$2.25. He sold them at 3¢ each. How much did he gain?

17. How many rods are there in  $\frac{5}{8}$  of a mile?

18. How many feet are there in  $\frac{6}{10}$  of a mile?

19. Find the cost of 24 yd. of cloth at  $3\frac{3}{8}$ ¢ a yard.

20. How many square feet are there on a surface 19 ft. long and  $18\frac{3}{4}$  ft. wide?

21. In the town of Onset there are 2752 people. In the town of Transea there are  $\frac{3}{4}$  as many. How many are there in both towns?

22. Add the prime factors of 858.

23. Find the L. C. M. of 8, 9, 10, and 15.

24. What even number is a prime number?

25. From sixty-one thousand twenty-four take forty-seven thousand eight hundred forty-nine.

26. The receipts of a ball game were \$30,206.16.  $\frac{3}{4}$  of this sum was divided among 54 players. How much did each receive?

27. A dealer has received a carload of coal weighing 50 tons. He has sold to-day as follows:  $7\frac{1}{2}$  tons,  $4\frac{3}{4}$  tons, 11 tons,  $\frac{1}{2}$  of a ton,  $\frac{1}{4}$  of a ton, and  $8\frac{1}{2}$  tons. How much has he left?

28. What multiple of 11 and 13 is between 140 and 150?

29. How much greater is  $89\frac{1}{7}$  than  $52\frac{7}{8}$ ?

30. What is the value of 675 bales of cotton, each containing 395 lb., at 9¢ a pound?

31. The dividend is the sum of 583,924 and 276,843. The divisor is 258. Find the quotient and the remainder.

REVIEW A—*Continued*

32.  $28 \times 5 \times ? = 16,800$ .

33. A man bought 9 cows for \$300 and sold them at \$48 each. How much did he gain?

34. A farmer took to town 43 lb. of chicken, which he sold @ 18¢, 18 doz. eggs @ 19¢, and 37 lb. of butter @ 22¢. He bought 50 lb. of sugar @  $5\frac{1}{2}$ ¢ and 24 yd. of muslin @ 12¢. How much money did he take home?

35. How many 4-oz. packages of nails can be made from 100 lb.?

36. Your desk is  $20\frac{1}{2}$  in. long and 14 in. wide. How many square inches are there on the top of it?

37. If a man smokes 3 ten-cent cigars a day, how much does his smoking cost in one year?

38. 124 bags of coffee, each weighing 45 lb., cost \$669.60. What did the coffee cost per pound?

39. A dealer paid \$550.80 for 648 bu. of wheat, which he sold at 98¢ a bushel. How much was his gain?

40. A manufacturer employs 43 men at \$2.25 per day, and 9 men at \$2.75 per day. What is his payroll for a month of 26 da.?

41. A dealer has sold  $385\frac{3}{4}$  bu. He has left  $49\frac{5}{8}$  bu. How many bushels had he at first?

42. I paid \$7.65 for 9 bu. of potatoes and \$7.50 for 4 bbl. of  $2\frac{1}{2}$  bu. each. How much cheaper per bushel was the second lot than the first?

43. Find the total cost of  $2\frac{7}{8}$  lb. of butter @ 32¢,  $3\frac{5}{8}$  lb. of meat @ 24¢, 3 doz. eggs @ 29¢, and 12 lb. of sugar @  $5\frac{3}{4}$ ¢.

REVIEW A—*Continued*

44. Add  $\frac{6}{7}$  of 343,  $\frac{8}{9}$  of 756, and  $\frac{9}{10}$  of 810.

45. A man worked during the week as follows: 8 hr., 9 hr., 12 hr.,  $7\frac{1}{2}$  hr., 8 hr., 5 hr. What is his pay for the week at 22¢ an hour?

46. A man at his death left an estate worth \$75,000. His widow received  $\frac{1}{3}$  of it and his daughter  $\frac{2}{15}$ . The remainder was divided among 4 sons. How much did each member of the family receive?

47. Write the prime numbers from 25 to 50.

48. Last fall Mr. Henry put 14 tons of coal into his bins. He already had  $1\frac{1}{3}$  tons left over from the previous season. This spring he has  $3\frac{3}{4}$  tons left. How many tons did he use during the winter?

49. A merchant having 840 bushels of grain sold  $\frac{1}{8}$  of it on Monday,  $\frac{1}{7}$  of it on Tuesday,  $\frac{1}{6}$  of it on Wednesday,  $\frac{3}{10}$  of it on Thursday,  $\frac{3}{4}$  of it on Friday, and the remainder on Saturday. Find each day's sales.

50.  $29\frac{1}{2} + 67\frac{3}{8} + 47\frac{3}{4} - 89\frac{5}{6} = ?$

## MULTIPLICATION DRILL

<i>A</i>	<i>B</i>	<i>C</i>
31,206 × 26 <hr/>	14,009 × 41 <hr/>	32,758 × 35 <hr/>
41,906 × 48 <hr/>	83,027 × 27 <hr/>	91,604 × 32 <hr/>
836,221 × 36 <hr/>	45,703 × 42 <hr/>	36,594 × 28 <hr/>
79,036 × 29 <hr/>	21,384 × 31 <hr/>	41,957 × 43 <hr/>
83,751 × 44 <hr/>	20,688 × 37 <hr/>	91,703 × 34 <hr/>
82,461 × 38 <hr/>	42,583 × 45 <hr/>	37,095 × 39 <hr/>
70,992 × 47 <hr/>	63,551 × 87 <hr/>	40,879 × 46 <hr/>
38,752 × 49 <hr/>	60,427 × 58 <hr/>	15,037 × 52 <hr/>
49,208 × 67 <hr/>	61,472 × 78 <hr/>	20,885 × 94 <hr/>

## DENOMINATE NUMBER DRILL

*Without copying the figures, write as many answers as possible to the following drills. Start and stop at the teacher's signal. Write for 5 minutes. Score 5 for each correct answer. Keep a record of results and compare with subsequent trials. Note improvement in speed and accuracy.*

1 pk. = ?	$16\frac{1}{2}$ ft. = ?	1 bu. = ? qt.
4 qt. = ?	1 rd. = ?	? da. = 1 wk.
1 mi. = ? ft.	160 sq. rd. = ?	144 sq. in. = ?
7 da. = ?	4 pk. = ?	60 min. = ?
32 qt. = ?	? oz. = 1 lb.	5280 ft. = ?
9 sq. ft. = ?	? qt. = 1 bu.	? sq. in. = 1 sq. ft.
1760 yd. = ?	320 rd. = ?	8 qt. = ?
? oz. = $\frac{1}{2}$ lb.	1 A. = ? sq. rd.	28-31 da. = ?
? qt. = 1 gal.	4 oz. = ?	1 hr. = ? min.
24 hr. = ?	8 oz. = ?	? yd. = 1 mi.
60 sec. = ?	1 gr. = ?	12 in. = ?
? pk. = 1 bu.	3 ft. = ?	? sec. = 1 min.
2 pt. = ?	365 da. = ?	? sq. ft. = 1 sq. yd.
? rd. = 1 mi.	36 in. = ?	4 pk. = ?

*How do you change*

gal to qt. ?	gi. to pt. ?	sq. ft. to sq. in. ?
rd. to mi. ?	lb. to oz. ?	qt. to gal. ?
oz. to lb. ?	pt. to gi. ?	yd. to mi. ?
ft. to yd. ?	pt. to qt. ?	sq. yd. to sq. ft. ?
pk. to bu. ?	bu. to pk. ?	ft. to in. ?
in. to yd. ?	qt. to pt. ?	sq. ft. to sq. yd. ?

## LESSON 13

## ORAL

1. What is the difference between 88 and 100?
2. Change  $\frac{80}{6}$  to a mixed number.
3. How many 72nds are there in  $\frac{8}{9}$ ?
4. How much change from a dollar is given for a purchase amounting to 48¢?
5. How many square feet are there in a floor 10 ft. wide and 14 ft. long?
6.  $\frac{12 \times 16}{4 \times 8} = ?$

## WRITTEN

1. Divide the product of 15, 18, 21, and 25 by the product of 9, 3, 7, 15, and 30. (Cancellation.)
2. How many square yards are there in a floor 18 ft. long by 13 ft. wide? (Cancellation.)
3. Find the cost to floor a room 192 in. long by 156 in. wide, @ \$3 per square yard.
4. (a) Write 8 million 5 hundred thousand six-hundred forty-four.  
(b) Write 24 million 846 thousand five.  
(c) Write fourteen million five hundred eight thousand two hundred twenty-two.
5. Find the difference between 100,100,100 and 90,900,090.
6. Change to a mixed number  $4\frac{653}{27}$ .
7. (a) Change  $\frac{7}{24}$  to a fraction whose denominator is 96  
(b) Change  $\frac{7}{24}$  to a fraction whose denominator is 144.
8.  $89\frac{7}{5}$  is how much larger than  $48\frac{8}{21}$ ?
9. How much change will I receive from a five-dollar bill after buying 10 doz. pencils @ 3¢ each?
10. What will it cost to sod a grass-plot 26 ft. long and 32 ft. wide, at \$.09 a square foot?

## TYPE VIII

## MULTIPLICATION OF A FRACTION BY A FRACTION

(a) *Units in Both Numerators*

1. Find the cost of
- $\frac{1}{2}$
- yd. of cloth @
- $\$ \frac{1}{2}$
- per yard.

$$\$ \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}. \quad \text{Ans.} \quad (a) \text{ Multiply the numerators together for the new numerator.}$$

$$\frac{(1 \times 1 = 1)}{(2 \times 2 = 4)} \quad (b) \text{ Multiply the denominators together for the new denominator.}$$

2.  $\frac{1}{4} \times \frac{1}{3} = ?$

3.  $\frac{1}{6} \times \frac{1}{7} = ?$

4.  $\frac{1}{3} \times \frac{1}{8} = ?$

(b) *Only One Numerator a Unit*

(Cancel wherever possible)

5. Multiply  $\frac{2}{3}$  by  $\frac{1}{3}$ .  $(\frac{2}{3} \times \frac{1}{3} = \frac{2}{15})$

6.  $\frac{\cancel{2}}{4} \times \frac{1}{\cancel{2}} = \frac{1}{4}.$

7.  $\frac{5}{7} \times \frac{1}{5} = ?$

8.  $\frac{3}{8} \times \frac{1}{6} = ?$

(c) *More than Units in Both Numerators*

9. What is the value of
- $\frac{8}{9}$
- yd. of cloth at
- $\$ \frac{3}{4}$
- per yard?

$$\frac{\$ \cancel{3}}{\cancel{4}} \times \frac{\cancel{8}}{\cancel{9}} = \$ \frac{2}{3}. \quad \text{Ans.}$$

10. At
- $\$ \frac{1}{2}$
- per lb., how much will
- $\frac{3}{4}$
- lb. of tea cost?

11. Bought
- $\frac{3}{4}$
- lb. of cheese @
- $\$ 2/5$
- . What did it cost me?

12. A yard of gold wire costs
- $\$ \frac{3}{5}$
- . How much must be paid for
- $\frac{35}{6}$
- yd.?

## LESSON 14

*Teach that  $16\frac{1}{2}$  ft. = 1 rd.*

## ORAL

1. How many feet are there in 1 rd.?
2.  $\frac{2}{3} \times \frac{4}{5} = ?$
3.  $\frac{3}{4} \times \frac{4}{9} = ?$
4. How many ounces are there in  $\frac{1}{4}$  of a pound?
5. Write the sum of 8 and 11 in Roman numerals.
6.  $\frac{25 \times 16}{5 \times 4} = ?$

## WRITTEN

1. Find the cost of  $\frac{2}{3}$  bu. of oats @  $\$ \frac{3}{4}$  per bushel.
2.  $\frac{4}{5} \times \frac{5}{6} = ?$
3. What is the value of  $\frac{7}{11}$  of  $\frac{1}{2}$  of  $\frac{2}{4}$ ?
4. The multiplier is  $\frac{7}{55}$ . The multiplicand is  $\frac{95}{14}$ .  
Find the product.
5. Add
 

51,638,692
18,462,307
750,982
9,040,040
321,456.

 Write the answer in words.
6. (a) Write one thousand two hundred sixty in Roman numerals.  
(b) Write 1915 in Roman numerals.
7. (a) How many feet are there in 440 rd.?  
(b) How many feet are there in 320 rd.?
8. Change 2 mi. to feet.
9. A barrel contains  $31\frac{1}{2}$  gal. What will 5 bbl. of vinegar cost @ \$.20 per gallon?
10. A bag of sulphur contains  $7\frac{1}{2}$  lb. How many ounces are there in 100 bags?

## LESSON 15

## ORAL

1.  $\frac{1}{4} \times \frac{3}{7} = ?$
2. The divisor is 6. The dividend is 96. What is the quotient?
3.  $\frac{8 \times 6 \times 9 \times 12}{9 \times 3 \times 8 \times 6} = ?$
4. How many feet are there in 2 rd.?
5. From 8 take  $5\frac{5}{12}$ .
6. Add  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{2}$ , and  $\frac{1}{10}$ .

## WRITTEN

1. Multiply  $\frac{8}{15}$  by  $\frac{3}{4}$ .
2. At  $\$ \frac{3}{5}$  a pound, what will  $\frac{7}{8}$  lb. of tea cost?
3. A farmer sowed  $\frac{4}{5}$  of an acre in 1 hr. What part of an acre did he sow in  $\frac{4}{5}$  of an hour?
4. What is the cost of  $\frac{3}{8}$  of a yard of silk @  $\$ \frac{4}{5}$  per yard?
5. What is the cost of  $\frac{3}{4}$  yd. of ribbon @  $\$ \frac{1}{5}$  per yard? Write the answer in cents.
6. The dividend is twenty seven million one hundred eighty thousand; the divisor is fifteen thousand one hundred. What is the quotient?
7. A grocer exchanged 4 cases, each containing 2 doz. cans of condensed milk, worth 11¢ a can, for 8 bags of potatoes of 2 bu. each. How much were the potatoes worth a bushel? (Cancellation.)
8. Add  $36\frac{3}{4}$ ,  $19\frac{1}{4}$ ,  $62\frac{3}{5}$ , and  $18\frac{4}{15}$ .
9. From 400 take  $163\frac{3}{11}$ .
10. A boy walked 24 rd. How many feet did he walk?

## TYPE IX

## TO MULTIPLY A MIXED NUMBER BY A FRACTION

1. Multiply  $7\frac{3}{4}$  by  $\frac{4}{5}$ .

$$7\frac{3}{4} = \frac{31}{4}$$

$$\frac{31}{4} \times \frac{4}{5} = \frac{31}{5} = 6\frac{1}{5}. \quad \text{Ans.}$$

*RULE: Change the mixed number to an improper fraction and proceed as in the multiplication of fractions.*

2.  $13\frac{3}{4} \times \frac{7}{15} = ?$
3. Multiply  $7\frac{1}{2}$  by  $\frac{2}{3}$ .
4.  $15\frac{2}{5} \times \frac{10}{13} = ?$
5.  $233\frac{1}{3} \times \frac{5}{8} = ?$
6.  $17\frac{8}{9} \times \frac{3}{8} = ?$
7.  $17\frac{1}{2} \times \frac{6}{7} = ?$
8.  $12\frac{3}{11} \times \frac{22}{5} = ?$
9. Multiply  $6\frac{2}{3}$  by  $\frac{13}{20}$ .
10.  $3\frac{3}{4} \times 2\frac{2}{3} = ?$

## LESSON 16

## ORAL

1.  $4 \times 2\frac{1}{2} = ?$
2.  $\frac{3}{8} \times \frac{4}{5} = ?$
3. What is  $\frac{3}{4}$  of 40?
4. A room 30 ft. long is  $\frac{1}{2}$  as wide as it is long. How wide is it?
5. How many pints in a gallon?
6. Take the sum of 3, 4, and 5 from 25.

## WRITTEN

1. At  $\$2\frac{3}{4}$  a yard, what will  $\frac{6}{7}$  of a yard of material cost?
2. A man rowed  $\frac{1}{9}$  of a mile in one minute. How far can he row in  $8\frac{3}{4}$  minutes?
3. At  $\$1\frac{7}{10}$  per bushel, what will  $4\frac{5}{8}$  bu. of corn cost?
4. If a pound of coffee costs  $\$1\frac{4}{10}$ , what will  $10\frac{5}{8}$  lb. cost?
5. A room is  $17\frac{1}{2}$  ft. long. It is  $\frac{5}{6}$  as wide as it is long. How wide is it?
6. A girl bought  $13\frac{1}{3}$  yd. of lace @  $\$1\frac{3}{8}$  a yard,  $4\frac{2}{3}$  yards of ribbon @  $\$1\frac{1}{4}$  a yard, and  $1\frac{5}{8}$  yd. of trimming @  $\$1\frac{1}{2}$  a yard. What did it all cost?
7. A field was divided into 3 parts,  $42\frac{1}{3}$  acres in one,  $29\frac{2}{5}$  acres in the second, and  $35\frac{1}{5}$  acres in the third. How many acres were there in all?
8. From  $93\frac{3}{8}$  take the sum of  $62\frac{3}{7}$  and  $29\frac{3}{4}$ .
9. Reduce 44 gal. to gills.
10. A cargo of grain of 24,000 bu. was shipwrecked and only  $\frac{3}{8}$  of it was saved. How much was lost?

## REVIEW IV

1. Simplify  $\frac{7 \times 15 \times 24 \times 84}{12 \times 49 \times 3 \times 14}$ .

2. A register card measures 5 in.  $\times$  8 in. How many such cards can be cut from a piece of cardboard 32 in.  $\times$  40 in.?

3.  $27\frac{3}{4} \times 10\frac{2}{3} = ?$

4.  $15\frac{3}{4} \times \frac{6}{7} \times 9 = ?$

5. Write and add sixty-three thousand seven; ninety thousand twenty; one thousand two hundred one; eight hundred five thousand ninety-seven.

6. Find the cost of  $\frac{5}{6}$  of a yard of cloth at \$1.50 a yard.

7. A shipment of copper weighing 800 lb. is found to contain  $\frac{3}{50}$  of its weight in pure copper. If copper is worth  $1\frac{1}{4}\text{¢}$  per oz., what was the value of the shipment?

8. Reduce  $58\frac{5}{8}$  lb. to oz.

9. James can jump  $6\frac{1}{2}$  ft. George can jump  $\frac{2}{3}$  as far. How far can George jump?

10. At 20¢ per pt. how much will a druggist receive for 2 gal. of wood alcohol?

## DIVISION DRILL

<i>A</i>	<i>B</i>	<i>C</i>
$456 \overline{)1,069,320}$	$432 \overline{)2,241,648}$	$453 \overline{)1,297,392}$
$564 \overline{)763,656}$	$564 \overline{)2,306,196}$	$756 \overline{)1,820,448}$
$654 \overline{)2,963,928}$	$868 \overline{)2,240,308}$	$978 \overline{)7,327,176}$
$356 \overline{)770,740}$	$284 \overline{)1,095,956}$	$459 \overline{)4,105,755}$
$653 \overline{)935,096}$	$824 \overline{)3,849,728}$	$789 \overline{)4,689,027}$
$536 \overline{)1,305,160}$	$863 \overline{)7,209,502}$	$583 \overline{)2,210,736}$
$453 \overline{)1,456,848}$	$324 \overline{)3,164,832}$	$534 \overline{)2,021,724}$
$426 \overline{)997,266}$	$654 \overline{)6,286,248}$	$675 \overline{)4,735,125}$
$356 \overline{)1,155,220}$	$786 \overline{)2,901,912}$	$897 \overline{)4,661,709}$
$236 \overline{)312,464}$	$736 \overline{)2,816,672}$	$573 \overline{)3,998,394}$
$361 \overline{)835,354}$	$637 \overline{)3,799,068}$	$386 \overline{)3,073,718}$
$265 \overline{)653,225}$	$953 \overline{)6,180,205}$	$659 \overline{)3,870,966}$
$234 \overline{)1,718,028}$	$345 \overline{)550,965}$	$347 \overline{)570,121}$
$456 \overline{)1,689,480}$	$576 \overline{)1,767,744}$	$631 \overline{)2,936,043}$
$687 \overline{)1,013,325}$	$798 \overline{)5,253,234}$	$524 \overline{)1,898,976}$
$915 \overline{)2,184,105}$	$364 \overline{)3,375,372}$	$413 \overline{)2,666,328}$
$951 \overline{)4,713,156}$	$675 \overline{)1,748,925}$	$723 \overline{)1,761,228}$
$519 \overline{)1,484,859}$	$467 \overline{)4,379,526}$	$914 \overline{)5,807,556}$

## LESSON 17

## ORAL

1. Find  $\frac{3}{8}$  of 48.
2. At  $\$ \frac{3}{4}$  a yard, what is the cost of  $\frac{1}{3}$  yd. of silk?
3. A sheet of cardboard containing 9 sq. ft. is 3 ft. long. What is the shape of the sheet?
4. Multiply 16 by  $1\frac{1}{4}$ .
5. From 32 take 18.
6. How many feet in one rod?

## WRITTEN

1.  $24\frac{1}{2} \times \frac{7}{1\frac{1}{2}} = ?$
2. A bushel contains  $\frac{4}{5}$  of a cubic foot. How many cubic feet are there in  $21\frac{5}{7}$  bu.?
3. If there are  $31\frac{1}{2}$  gal. in a barrel, how many gallons are there in  $\frac{8}{15}$  of a barrel?
4. A man bought  $220\frac{3}{4}$  yd. of bunting @  $\$ \frac{5}{8}$  a yard. What did it cost?
5. The area of a rectangle is 285,516 sq. yd. If it is 924 yd. long, how wide is it?
6. Find the total cost of a house and lot, if the lot cost \$3600 and the house cost  $2\frac{3}{4}$  times the cost of the lot.
7. What will it cost to carpet a room, requiring  $28\frac{1}{2}$  yd. of carpet, @  $\$ \frac{7}{8}$  a yard?
8. Add fifty-four thousand six hundred nine; one hundred fifty-six thousand nine hundred; five hundred eighteen thousand one hundred twenty-seven.
9. From nine hundred thousand nine, take nine thousand ninety.
10. A race track is 180 rd. long. How many feet long is it?

## TYPE X

## MULTIPLICATION OF A MIXED NUMBER BY A MIXED NUMBER

1. Find the cost of  $6\frac{1}{4}$  yd. of silk @  $\$1\frac{1}{2}$  per yard.

$$\$1\frac{1}{2} \times 6\frac{1}{4} = ?$$

$$(a) \quad 1\frac{1}{2} = \frac{3}{2}. \quad 6\frac{1}{4} = \frac{25}{4}.$$

$$(b) \quad \$\frac{3}{2} \times \frac{25}{4} = \$\frac{75}{8} = \$9\frac{3}{8}. \quad \text{Ans.}$$

Change each mixed number to an improper fraction, and proceed as in multiplication of fractions.

2. What will  $70\frac{1}{2}$  yards of carpet cost @  $\$1\frac{2}{3}$  per yard?
3. A man travels  $47\frac{1}{2}$  mi. a day. How far will he go in  $12\frac{2}{3}$  days?
4. If butter is  $37\frac{1}{2}\text{¢}$  a pound, what will  $12\frac{1}{4}$  lb. cost?
5. Coal is  $\$6\frac{3}{4}$  per ton. What will  $14\frac{2}{3}$  tons cost?
6.  $7\frac{1}{2}$  yards of carpet are needed for a hall. Find its cost @  $\$2\frac{2}{3}$  per yard.
7. A farmer gathered  $20\frac{1}{4}$  bu. of oats per day. How many bushels did he gather in  $6\frac{2}{3}$  days?
8. Mr. Brown saves  $\$5\frac{1}{4}$  each week. How much does he save in  $14\frac{2}{3}$  days?
9. How much will a man earn in  $17\frac{1}{2}$  days if he earns  $\$2\frac{2}{5}$  per day?
10. Find the product of  $17\frac{5}{9}$  and  $11\frac{4}{7}$ .

## LESSON 18

## ORAL

1. How many pecks in  $2\frac{1}{2}$  bu.?
2. Reduce  $\frac{5}{8}$  hr. to minutes.
3. Change  $\frac{1}{3}\frac{2}{2}$  to lowest terms.
4. How many quarter pounds in  $7\frac{3}{4}$  lb.?
5. How many square yards in 108 sq. ft.?
6. From 3 take  $1\frac{4}{5}$ .

## WRITTEN

1. At  $\$2\frac{4}{5}$  a yard, find the cost of  $24\frac{3}{8}$  yd. of cloth.
2. 100 bbl. of apples, each containing  $2\frac{1}{2}$  bu., were sold for  $\$1\frac{1}{2}\frac{7}{10}$  per bushel. What did they sell for?
3. A peddler bought 3 bbl. of potatoes, each containing  $2\frac{1}{2}$  bushels, for  $\$3\frac{3}{5}$  per bushel. He sold them @  $\$1\frac{1}{5}$  per bushel. How much did he gain?
4. It takes a bank clerk 5 hr. to count 30,000 coins. How many would he count in one minute?
5. (a) Reduce to lower terms,  $\frac{14}{84}$ ,  $\frac{90}{120}$ ,  $\frac{26}{65}$ .  
(b)  $\frac{5}{16}$  of 5072 = ?
6. How many feet are there in 320 rd.?
7. Mr. Johnson is  $29\frac{5}{2}$  yr. old. Mr. James is 35 yr. old. What is the difference in their ages?
8. A pole  $39\frac{7}{5}$  ft. long is broken into 3 pieces. One piece is  $16\frac{1}{8}$  ft. long, another is  $10\frac{1}{6}$  ft., long. How long is the third piece?
9. What is the cost of cementing a cellar floor 36 ft. square, @ 42¢ a square yard?
10. Divide 869,768 by 652 and multiply the answer by 1000.

## LESSON 19

## ORAL

1.  $1\frac{1}{2} \times 1\frac{1}{2} = ?$
2. A ball cost 50¢ and a bat one-half as much. What was the cost of both?
3. Find the sum of  $\frac{5}{8}$  and  $\frac{2}{3}$ .
4. The difference between two numbers is 25. If one of the numbers is 17, what is the other number?
5. From 2 take the sum of  $\frac{1}{2}$  and  $\frac{3}{4}$ .
6. Add 8, 9, 10, 11, and 12.

## WRITTEN

1. Multiply  $22\frac{5}{16}$  by  $5\frac{5}{7}$ .
2.  $8\frac{1}{3} \times 12\frac{4}{9} = ?$
3. Find the cost of  $27\frac{1}{3}$  yd. of cloth @  $\$1\frac{7}{8}$  a yard.
4. Find the cost of  $12\frac{3}{4}$  tons of coal @  $\$6\frac{3}{4}$  a ton.
5. A farmer gathers  $16\frac{2}{3}$  bu. of potatoes in one hour. How many will be gather in  $16\frac{1}{2}$  hr.?
6. A horse cost  $\$187\frac{1}{2}$ . A wagon cost  $\frac{4}{5}$  as much. How much more did the horse cost than the wagon?
7. A boy saved  $\$1\frac{3}{8}$  a week. At the same rate, how much will he save in  $27\frac{1}{2}$  weeks?
8. What is the product of the sum and the difference of  $4\frac{1}{4}$  and  $6\frac{1}{3}$ ?
9. Mr. Peabody had  $\$227\frac{3}{4}$  in the bank and put in at different times,  $\$149\frac{1}{2}$ ,  $\$317\frac{5}{10}$  and  $\$516\frac{5}{100}$  more. How much did he have in all?
10. From  $90\frac{5}{9}$  yd. a tailor cut  $43\frac{3}{4}$  yd., and  $34\frac{1}{2}$  yd. How many yards were left?

## LESSON 20

## ORAL

1. At  $\$1\frac{3}{4}$  each, what is the cost of 4 umbrellas?
2. How many square feet in 6 sq. yd.?
3. Minuend 30, remainder 8. What is the subtrahend?
4. How many pints in  $1\frac{1}{2}$  gal.?
5. If 5 shovels cost \$4.50, what is the cost of one shovel?
6. How many quarts in  $\frac{1}{2}$  bu.?

## WRITTEN

1. At  $\$2\frac{3}{4}$  each, find the cost of books for 60 pupils.
2. If land is worth  $\$48\frac{1}{2}$  an acre, what will  $12\frac{4}{5}$  acres cost?
3. How many square feet are there in a floor  $10\frac{2}{3}$  yd. long and  $6\frac{1}{2}$  yd. wide?
4. When coal is worth  $\$5\frac{1}{2}$  a ton, what will  $2\frac{1}{2}$  tons cost?
5. The remainder is  $160\frac{5}{9}$ . The minuend is  $300\frac{1}{3}$ . Find the subtrahend.
6. If a large barrel holds  $37\frac{3}{4}$  gal., how many quarts will there be in  $2\frac{1}{2}$  bbl.?
7. A dealer bought 150 bbl. of flour. He sold  $\frac{2}{5}$  of it @ \$4.75 a barrel and the remainder @ \$5.60 a barrel. How much did he receive?
8. Write the number 1805 in Roman numerals.
9. If 45 coats cost \$607.50, what will 19 coats cost?
10. How many two-quart bags are needed to contain 3 bu. of seed?

## REVIEW V

1. Mr. Smith bought  $6\frac{9}{16}$  yd. of ribbon, which cost  $\$ \frac{4}{5}$  per yard. How much did he pay for the ribbon?

2. A playground contains 1272 sq. ft. It is 24 ft. long. How wide is it?

3. From seventy-three thousand six, take forty-nine thousand four hundred twenty-three.

4. Find the cost of  $5\frac{2}{3}$  bbl. of potatoes @ \$2.25 per barrel.

5. At the rate of  $3\frac{3}{4}$  mi. per hour, how far can you go in  $4\frac{1}{5}$  hr.?

6. A train travels 3520 ft. in a minute. How long will it take to travel 120 mi.? (Cancellation.)

7. At \$2 a square yard, what will it cost to cement a basement floor, 40 ft. by 24 ft.?

8. A stationer bought 12 gr. of pencils @ \$1.50 a gross. He sold a third of them @ 5¢ each,  $\frac{1}{2}$  of them @ 4¢ each, and the remainder @ 2¢ each. How much did he gain?

9. A basket of peaches contains 12 qt. In canning it requires 3 pt. to fill a quart can. How many quart cans can be filled from 4 baskets?

10. From the sum of 1,960,484, 284,003, and 576,695, take the sum of 78,920 and 1,404,006.

## DIVISION DRILL

*A*

$$26 \overline{)811,356}$$

$$48 \overline{)2,011,488}$$

$$36 \overline{)30,103,956}$$

$$44 \overline{)3,685,044}$$

$$38 \overline{)3,133,518}$$

$$52 \overline{)781,924}$$

$$45 \overline{)1,916,235}$$

$$78 \overline{)4,794,816}$$

*B*

$$41 \overline{)574,369}$$

$$27 \overline{)2,241,729}$$

$$42 \overline{)1,919,526}$$

$$37 \overline{)765,456}$$

$$67 \overline{)3,296,936}$$

$$87 \overline{)5,528,937}$$

$$49 \overline{)1,898,848}$$

$$46 \overline{)1,880,434}$$

*C*

$$35 \overline{)1,146,530}$$

$$32 \overline{)2,931,328}$$

$$28 \overline{)1,024,632}$$

$$34 \overline{)3,117,902}$$

$$94 \overline{)1,963,190}$$

$$39 \overline{)1,446,705}$$

$$58 \overline{)3,504,766}$$

$$47 \overline{)3,336,624}$$

## FRACTION DRILL I

## SHORT METHOD

$$\frac{1}{2} + \frac{1}{3} = ?$$

$$\frac{1}{2} + \frac{1}{3} = \frac{(2+3)}{(2 \times 3)} = \frac{5}{6}.$$

RULE: *Add the denominators for a new numerator, multiply the denominators for a new denominator.*

$$\frac{1}{6} + \frac{1}{10} = ?$$

$$\frac{1}{2} + \frac{1}{8} = ?$$

$$\frac{1}{5} + \frac{1}{9} = ?$$

$$\frac{1}{2} + \frac{1}{3} = ?$$

$$\frac{1}{4} + \frac{1}{10} = ?$$

$$\frac{1}{9} + \frac{1}{10} = ?$$

$$\frac{1}{4} + \frac{1}{5} = ?$$

$$\frac{1}{7} + \frac{1}{12} = ?$$

$$\frac{1}{3} + \frac{1}{6} = ?$$

$$\frac{1}{6} + \frac{1}{12} = ?$$

$$\frac{1}{2} + \frac{1}{9} = ?$$

$$\frac{1}{5} + \frac{1}{10} = ?$$

$$\frac{1}{2} + \frac{1}{4} = ?$$

$$\frac{1}{4} + \frac{1}{12} = ?$$

$$\frac{1}{9} + \frac{1}{12} = ?$$

$$\frac{1}{4} + \frac{1}{6} = ?$$

$$\frac{1}{2} + \frac{1}{10} = ?$$

$$\frac{1}{3} + \frac{1}{7} = ?$$

$$\frac{1}{2} + \frac{1}{5} = ?$$

$$\frac{1}{8} + \frac{1}{9} = ?$$

$$\frac{1}{5} + \frac{1}{12} = ?$$

$$\frac{1}{4} + \frac{1}{7} = ?$$

$$\frac{1}{2} + \frac{1}{12} = ?$$

$$\frac{1}{3} + \frac{1}{8} = ?$$

$$\frac{1}{7} + \frac{1}{8} = ?$$

$$\frac{1}{5} + \frac{1}{6} = ?$$

$$\frac{1}{3} + \frac{1}{9} = ?$$

$$\frac{1}{2} + \frac{1}{6} = ?$$

$$\frac{1}{8} + \frac{1}{10} = ?$$

$$\frac{1}{6} + \frac{1}{7} = ?$$

$$\frac{1}{4} + \frac{1}{8} = ?$$

$$\frac{1}{5} + \frac{1}{7} = ?$$

$$\frac{1}{3} + \frac{1}{10} = ?$$

$$\frac{1}{7} + \frac{1}{9} = ?$$

$$\frac{1}{8} + \frac{1}{12} = ?$$

$$\frac{1}{6} + \frac{1}{8} = ?$$

$$\frac{1}{2} + \frac{1}{7} = ?$$

$$\frac{1}{3} + \frac{1}{4} = ?$$

$$\frac{1}{3} + \frac{1}{12} = ?$$

$$\frac{1}{4} + \frac{1}{9} = ?$$

$$\frac{1}{5} + \frac{1}{8} = ?$$

$$\frac{1}{6} + \frac{1}{9} = ?$$

$$\frac{1}{7} + \frac{1}{10} = ?$$

$$\frac{1}{3} + \frac{1}{5} = ?$$

$$\frac{1}{10} + \frac{1}{12} = ?$$

## LESSON 21

*Teach the meaning of average.*

## ORAL

1. Find the cost of 6 lb. of meat @  $\$1\frac{1}{5}$  per pound.
2. If I buy one pound of coffee for 35¢ and another pound for 25¢, what is the average price of the coffee?
3.  $11 + 15 + 13 + 20 = ?$
4.  $\frac{5}{6} - \frac{1}{2} = ?$
5. Multiply 365 by 100.
6.  $\frac{9 \times 15}{3 \times 5} = ?$

## WRITTEN

1. What is the cost of  $16\frac{2}{3}$  yd. of goods, if one yard is worth  $\$3\frac{3}{5}$ ?
2. A boy can walk  $2\frac{1}{7}$  mi. in 1 hour. How many miles can he walk in  $12\frac{7}{10}$  hr.?
3. Find the cost of  $14\frac{2}{3}$  tons of coal @  $\$7\frac{3}{4}$  a ton.
4. If I buy 26 acres of land @  $\$96$  an acre, and 22 acres @  $\$144$  an acre, what is the average price for all?
5. 8 tons of coal bought at one time cost  $\$4.75$  per ton. At another time 12 tons cost  $\$6.25$  per ton. What was the average price per ton for all?
6. Find the wages due a laborer for  $17\frac{1}{2}$  hr. work @  $\$2\frac{1}{5}$  an hour.
7.  $17\frac{8}{15} + 3\frac{7}{10} + 1\frac{4}{5} = ?$
8.  $\frac{7}{8} + \frac{8}{9} - \frac{1}{2} - \frac{2}{3} + 1\frac{7}{2} = ?$
9. By the cancellation method, find how many barrels of potatoes of 2 bu. each, worth 60¢ a bushel, a farmer must exchange for 5 boxes of canned goods of 4 doz. each, worth 10¢ a can.
10. How many quarts are there in  $16\frac{3}{8}$  bu.?

## TYPE XI

A. COST OF ONE AND GAIN ON ALL BEING GIVEN, TO FIND  
THE SELLING PRICE OF ONE

1. I bought 3 horses @ \$175 each, and sold them at a total gain of \$75. How much did they sell for apiece?

## FIRST METHOD

<p>(a) \$175 cost of 1 horse.</p> $\begin{array}{r} \times 3 \\ \hline \$525 \end{array}$ <p>\$525 cost of all.</p>	<p>(b) \$525 cost.</p> $\begin{array}{r} +75 \\ \hline \$600 \end{array}$ <p>\$600 selling price.</p>
<p>(c) <math>3 \overline{)600}</math> selling price of all.</p> <p style="padding-left: 100px;">\$200 selling price of 1.</p>	

## SECOND METHOD

<p>(a) <math>3 \overline{) \\$75}</math> gain on 3 horses.</p> <p style="padding-left: 40px;">\$25 gain on 1 horse</p>	<p>(b) \$175 cost of 1 horse</p> <p style="padding-left: 40px;">+25 gain on 1 horse</p> <p style="padding-left: 40px;"><u>\$200</u> selling price of 1 horse</p>
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2. A butcher buys 200 lb. of beef @ 12¢ per pound. He sells it at a profit of \$16.00. At what price per pound does he sell it?

3. Goods costing 24¢ each are sold at a total profit of \$9.00. If 150 are sold, how much did each sell for?

TYPE XI—*Continued***B. COST AND LOSS BEING GIVEN, TO FIND THE SELLING PRICE OF ONE**

4. A grocer buys 40 bu. of potatoes @ \$.50 per bushel, and sells them at a loss of \$4.00. How much did they sell for per bushel?

<p>(a) <math display="block">\begin{array}{r} 40 \overline{) \\$4.00} \end{array}</math> <div style="display: flex; justify-content: space-between;"> <span>total loss.</span> <span>(b) \$.50 cost of 1 bushel.</span> </div> <div style="display: flex; justify-content: space-between;"> <span>\$ .10 loss on 1 bushel.</span> <span><math display="block">\begin{array}{r} - .10 \\ \hline \end{array}</math> loss on 1 bushel.</span> </div> <div style="display: flex; justify-content: space-between;"> <span></span> <span><math display="block">\begin{array}{r} \hline \\$ .40 \end{array}</math> selling price per bushel.</span> </div> </p>	
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5. \$90 was lost in the sale of 30 cows, which cost originally \$40 each. Find the selling price of each cow.

6. In selling 20 yd. of velvet, which cost me \$1.40 per yard, I lost \$4.00. For how much did the velvet sell a yard?

7. The selling price of 8 articles which cost \$1.92 each gave a loss of \$.48. For how much was each article sold?

8. At an auction sale, 12 chairs were sold for \$28.80 less than they had cost. If the original price of the chairs was \$4.50 each, for how much per chair did they sell at the auction?

## LESSON 22

## ORAL

1. I bought 2 lb. of tea for 60¢ and sold it so as to gain 20¢. What was the selling price per pound?
2. If \$3 is lost by selling goods for \$13, for what should they be sold to gain \$7?
3. Find  $\frac{2}{3}$  of 63.
4. Multiply  $\frac{12}{5}$  by  $\frac{5}{2}$ .
5.  $101 - 38 = ?$
6. Write 67 in Roman notation.

## WRITTEN

1. If I buy 422 sheep @ \$4.25 per head, for how much must I sell them to make a profit of \$527.50?
2. A dealer bought 48 bbl. of potatoes for \$1.75 per barrel. He sold them at a gain of \$19.20. For how much per barrel did he sell them?
3. A man made a profit of \$700 on 1400 bbl. of apples, which he sold for \$3150. How much did they cost him per barrel?
4. A merchant had a loss of \$91.50 on 122 yd. of silk, which he sold @ \$2.25 per yard. Find the cost per yard.
5. I bought 50 tons of coal @ \$4.25 per ton and sold them at a loss of \$12.50. Find the selling price per ton.
6. If the selling price was \$590.75 and the loss was \$69.50, what was the cost per head of 139 sheep?
7. Multiply  $7\frac{3}{41}$  by  $8\frac{1}{5}$ .

LESSON 22—*Continued*

8. Multiply  $45\frac{6}{7}$  by  $16\frac{7}{21}$ .

9. Add 40,302,751

2,967,804

47,258,342

10,025,196

80,302,007

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10. Write in Roman numerals, 49, 114, 398, 1105.

## LESSON 23

## ORAL

1. I bought 3 sewing machines @ \$30 each and gained \$10 when I sold them. For how much were they sold?
2. If there is a loss of 25¢ when 4 books are sold for \$1.75, what was the cost of each book?
3.  $\frac{40 \times 15}{20} = ?$
4.  $\frac{8}{9} + \frac{2}{3} = ?$
5. Find the cost of  $\frac{3}{8}$  of a yard of cloth @ \$.80 per yard.
6. Three boys are respectively 14, 16, and 9 yr. old. What is the average age of the boys?

## WRITTEN

1. If I sell 12 doz. eggs, which cost me 30¢ per dozen, at a loss of 24 cents, what is the selling price?
2. If I sell 40 yd. of velvet, at a total gain of \$10, for \$150.00, what did the velvet cost me a yard?
3. A merchant made a profit of \$183 on 244 yards of carpet which he had sold @ \$2.25 per yard. What was the cost of the carpet per yard to the merchant?
4. A grocer sold 200 doz. cans of condensed milk at a profit of 2¢ a can. The milk cost him \$192. What did he sell it for per can?
5. A speculator sold 68 head of cattle for \$2618. He lost \$289. At what price per head should he have sold them in order to gain \$170?

LESSON 23—*Continued*

6.  $\frac{48 \times 24 \times 6 \times 7}{9 \times 12 \times 34 \times 18} = ?$

7. Add 3,069,274

4,309,825

7,071,593

800,627

49,372

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8.  $4\frac{1}{2} - 2\frac{2}{3} + 5\frac{3}{7} - 1\frac{3}{4} = ?$

9. I sold 4 bbl. of apples for \$11. Find the cost of  $8\frac{3}{5}$  bbl. at the same price.

10. The attendance of a class was 41 one day, 45 another day, and 46 the third day. Find the average attendance per day.

## LESSON 24

## ORAL

1. If a merchant buys 6 cans of corn for 72¢ and sells it so as to gain 2¢ a can, what is the selling price of 1 can?
2.  $\frac{4 \times 6 \times 8}{2 \times 3 \times 4} = ?$
3. Find  $\frac{2}{3}$  of 90.
4. Find the area of a 10-ft. square.
5. How many gallons are there in 60 qt.?
6. Change 48 oz. to pounds.

## WRITTEN

1. A grocer bought 189 bbl. of flour for \$897.75. What should be the selling price per barrel in order to gain \$425.25?
2. I bought 200 shares of stock @ \$90 per share, and lost \$450. What did one share sell for?
3. By selling 8 pianos for \$3600, I lost \$200. Find the cost of 1 piano.
4. If 15 yd. of cloth are sold for \$1.05, at a gain of 30 cents, find the cost price per yard.
5. By cancellation find the answer to the following:  $(16 \times 5 \times 24 \times 96)$  divided by  $(144 \times 25 \times 8 \times 2 \times 32)$ .
6. A man bought 72 bbl. of sugar @ \$18.90 per barrel. He sold  $\frac{1}{3}$  of it at \$21.10 per barrel,  $\frac{1}{4}$  of it at \$17.15 per barrel, and the remainder at cost price. Did he gain or lose, and how much?

**LESSON 24**—*Continued*

7. What is the difference between two surfaces, one 68 ft. square, and the other containing 4272 sq. ft.?

8. How many gallons are there in 4240 qt.? How many pints?

9. If 12 lb. of ginger are packed in 2-oz. packages and sold at 8¢ an oz., how much will the entire quantity sell for?

10. Multiply the sum of  $4\frac{8}{9}$  and  $3\frac{2}{3}$  by their difference.

## REVIEW VI

1. Write in Roman numerals 45, 154, 591.
2. A man worked  $7\frac{1}{2}$  hr. a day for  $2\frac{2}{3}$  days. How much should he receive @ \$.50 an hour?
3. A dealer bought 3 doz. waists @ \$21 per dozen. He sold them all at a gain of \$8.28. At what price did he sell each waist?
4. The registers of 4 classes are 43, 48, 47 and 50. What is the average register?
5. A merchant bought 300 straw hats @ \$.75 each. He sold them at a gain of \$150. At what price did he sell each hat?
6. A merchant lost \$12 on the sale of 150 yd. of cloth, which cost him \$.42 a yard. At what price per yard did he sell the cloth?
7. At what price per yard must a merchant sell cloth if he pays \$486 for 324 yd. and sells it so as to gain  $\frac{1}{3}$  of the cost?
8. Add 5,940,608; 2,967,416; 580,007; 10,025,040; 7,308,105.
9. Add the product of  $4\frac{1}{2}$  and  $1\frac{5}{8}$  to the product of  $2\frac{2}{3}$  and  $\frac{5}{16}$ .
10. A farmer traded 18 bbl. of potatoes, of 3 bu. each, worth \$.75 a bu., for sugar worth \$20.25 per barrel. How many barrels of sugar did he receive?

## RAPID FACTOR DRILL

Without copying the figures, write as many answers as possible to the following drills in the time allowed. Start and stop on signal. Write for 5 minutes. Score 5 for each correct answer. Keep a record of results and compare with subsequent trials. Note improvement in speed and accuracy.

A	B	C	D
6) <u>54</u>	? <u>60</u>	11) <u>44</u>	$70 \div ? = 5$
?	5	?	$11 \times ? = 33$
$? \times 9 = 36$	$11 \times 5 = ?$	$54 \div ? = 6$	$7 \times 7 = ?$
$\frac{1}{12}$ of 96 = ?	14) <u>70</u>	$55 \div 11 = ?$	3) <u>?</u>
$84 \div ? = 7$	?	5) <u>40</u>	29
$9 \times ? = 63$	4) <u>88</u>	?	$? \div 4 = 8$
? <u>49</u>	?	$\frac{1}{4}$ of 36 = ?	8) <u>64</u>
7	$48 \div 4 = ?$	$69 \div ? = 23$	?
$8 \times 8 = ?$	11) <u>121</u>	$13 \times ? = 39$	$? \times 2 = 58$
8) <u>56</u>	?	$16 \times 6 = ?$	$\frac{1}{5}$ of 30 = ?
?	$\frac{1}{8}$ of 72 = ?	2) <u>?</u>	$56 \div ? = 8$
$? \div 7 = 6$	12) <u>144</u>	43	$2 \times ? = 74$
$132 \div 11 = ?$	?	$? \div 5 = 7$	? <u>28</u>
9) <u>108</u>	$? \times 5 = 45$	$84 \div 7 = ?$	4
?	$51 \div ? = 3$	19) <u>57</u>	$7 \times 6 = ?$
$? \times 11 = 99$	? <u>81</u>	?	11) <u>?</u>
$\frac{1}{10}$ of 100 = ?	27	$? \times 2 = 34$	8
$110 \div 11 = ?$	$17 \times 5 = ?$	$\frac{1}{3}$ of 63 = ?	$? \div 3 = 9$
$10 \times ? = 120$			

## REVIEW B

1. Change  $133\frac{7}{10}$  to an improper fraction.
2. Add  $87\frac{3}{4}$ ,  $79\frac{5}{6}$ ,  $65\frac{7}{9}$ , and  $37\frac{1}{2}$ .
3. Mr. Smith bought  $5\frac{1}{2}$  lb. of meat. I bought  $\frac{3}{4}$  as much. How much did mine cost at 24¢ a pound?
4. What will it cost to paint a ceiling 15 ft. by 14 ft., at 12¢ a square foot?
5. From the sum of  $58\frac{3}{5}$  and  $43\frac{3}{4}$  subtract  $49\frac{9}{10}$ .
6. A field is 7 rd. long and 6 rd. wide. If it requires 5 lb. of grass seed for a square rod, how much will it cost to seed the field at 5¢ a pound?
7. Find the cost of  $\frac{3}{8}$  of a yard of silk at \$3.60 a yard.
8. The divisor is eight hundred nine; the quotient is seven hundred eighty-nine. Find the dividend.
9. Divide  $65 \times 84 \times 96 \times 72$  by  $70 \times 64 \times 104 \times 54$ .
10. A room is  $24\frac{1}{2}$  ft. long. It is  $\frac{6}{7}$  as wide. How wide is it?
11. Find the prime factors of 154.
12. At 75¢ a square yard, what will it cost to cover a floor 15 ft. long and 12 ft. wide? (Cancellation.)
13. Write and add seven hundred eighty-nine thousand nine hundred eight; eighty thousand seven hundred; eight thousand seventy-nine; six hundred seventy thousand eight hundred fifty.
14. Change  $8\frac{7}{19}$  to a mixed number.
15. Change 19 rd. to feet.
16. Write 649 in Roman numerals.

REVIEW B—*Continued*

17. What is the value of 3 bbl. of cider, each of  $31\frac{1}{2}$  gal., at 25¢ a gallon?

18. How much is  $\frac{7}{8}$  of  $3\frac{1}{2}$ ?

19. If there are  $31\frac{1}{2}$  gal. in a barrel, how many gallons are there in  $\frac{2}{3}$  of a barrel?

20. A lot cost \$800 and the house on it  $4\frac{2}{3}$  times as much. What was the cost of both?

21. A dealer put 84 bu. of grass seed into packages containing 1 qt. each. How many packages did he have?

22. The temperature at noon for 5 days was  $67^{\circ}$ ,  $72^{\circ}$ ,  $75^{\circ}$ ,  $78^{\circ}$ , and  $73^{\circ}$ . What was the average temperature?

23. From 600 take  $483\frac{5}{12}$ .

24. What is the distance in feet around two sides of a field 7 rd. long and 6 rd. wide?

25. How many feet are there in  $\frac{2}{3}$  of a rod?

26. A train ran  $37\frac{1}{3}$  miles in an hour. At the same rate, how far would it run in  $\frac{3}{4}$  of an hour?

27. Find the cost of  $2\frac{1}{6}$  lb. of butter at 32¢ a pound and  $6\frac{7}{8}$  lb. of meat at 24¢ a pound.

28. From the sum of  $49\frac{6}{7}$  and  $58\frac{9}{10}$  take  $69\frac{1}{2}$ .

29. In a certain hall there are 588 sq. yd. If it is 54 ft. wide, how long is it?

30. Add two hundred seventy thousand five; five hundred six thousand twenty-nine; eight thousand eight hundred seventy-nine.

31. A fence is to be 8 rd. long. The fence rails are 12 ft. long. How many rails are needed?

REVIEW B—*Continued*

32. From sixty-one thousand twelve take eight thousand nine hundred seventy-eight.

33. At the rate of  $37\frac{1}{2}$  mi. per hour, how far can an auto run in  $4\frac{2}{3}$  hr.?

34. A farmer sold 72 bbl. of apples, each containing  $2\frac{1}{2}$  bu., at \$1.75 per bushel. How much did he receive for them?

35. Multiply  $12\frac{2}{3}$  by  $16\frac{7}{8}$ .

36. If one barrel holds  $31\frac{1}{2}$  gal., how many quarts are there in 7 bbl.?

37. A dealer bought 640 tons of coal. He sold  $\frac{7}{8}$  of it at \$6.80 a ton and the remainder @ \$6.25. How much did he receive in all?

38. I bought two cases of eggs, each containing 30 doz., at 29¢ a dozen. I sold them, gaining \$4.80. At what price did I sell them?

39. A merchant sold 48 yd. of muslin @  $9\frac{1}{2}$ ¢, 56 yd. @  $11\frac{1}{4}$ ¢, and 46 yd. @ 9¢. What was the average selling price per yard?

$$40. \frac{51 \times 57 \times 69 \times 70}{63 \times 76 \times 85 \times 115} = ?$$

41. A broker sold 98 shares of stock at \$96 each, thus gaining \$147. What did each share cost him?

42. Which is larger, and how much, a floor space containing 59 sq. yd. or one 24 ft. by 21 ft.?

43. If 24 lb. of ginger is put in cans, each holding 4 oz., and sold at 15¢ a can, what will be received for it?

44. It is  $168\frac{3}{4}$  mi. from B to M. How far is  $\frac{4}{5}$  of the distance?

REVIEW B—*Continued*

45. How many feet are there in  $12\frac{1}{2}$  rd. ?
46. How many square feet are there in a room  $18\frac{2}{3}$  ft. long and  $15\frac{1}{2}$  ft. wide ?
47. Divide 81,750 by 125 and divide the quotient by 5.
48. Find the product of the sum of  $2\frac{1}{2}$  and  $3\frac{7}{8}$  and the difference of  $6\frac{1}{3}$  and  $2\frac{5}{6}$ .
49. Write 699 in Roman numerals.
50. A dealer bought 128 yd. of cloth. He sold  $59\frac{3}{4}$  yd. @ 40¢ and  $\frac{2}{3}$  of the remainder @ 32¢. What did he receive for the part sold ?

## DENOMINATE NUMBER DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Start and stop at the teacher's signal. Write for 5 minutes. Score 5 for each correct answer. Keep results and compare with subsequent results. Note improvement in speed and accuracy.*

16 oz. = ?	24 hr. = ?	4 pk. = ?
12 things = ?	? da. = 1 wk.	1 pk. = ?
? oz. = 1 lb.	144 sq. in. = ?	4 qt. = ?
? qt. = 1 bu.	60 min. = ?	1 mi. = ? ft.
$16\frac{1}{2}$ ft. = ?	5280 ft. = ?	7 da. = ?
320 rd. = ?	$16\frac{1}{2}$ ft. = ?	32 qt. = ?
? pk. = 1 bu.	60 sec. = ?	9 sq. ft. = ?
? ft. = 1 yd.	8 qt. = ?	1760 yd. = ?
4 oz. = ?	1 rd. = ? ft.	? oz. = $\frac{1}{2}$ lb.
1 yr. = ? mo.	28-31 da. = ?	? qt. = 1 gal.
3 ft. = ?	1 hr. = ? min.	? sq. in. = 1 sq. ft.
365 da. = ?	? yd. = 1 mi.	? sq. ft. = 1 sq. yd.
36 in. = ?	12 in. = ?	2 pt. = ?
1 bu. = ? qt.	? sec. = 1 min.	? rd. = 1 mi.
	8 oz. = ?	

*How do you change*

ft. to rd. ?	bu. to pk. ?	qt. to pt. ?
yd. to in. ?	ft. to in. ?	rd. to ft. ?
pt. to gal. ?	sq. ft. to sq. yd. ?	in to yd. ?
lb. to oz. ?	ft. to yd. ?	sq. ft. to sq. in. ?
things to doz. ?	pk. to bu. ?	qt. to gal. ?
gi. to pt. ?	gal. to qt. ?	yd. to mi. ?
mi. to rd. ?	rd. to mi. ?	sq. yd. to sq. ft. ?
pt to qt. ?	oz. to lb. ?	sq. in. to sq. ft. ?

## TYPE XII

## TO FIND WHAT PART ONE NUMBER IS OF ANOTHER

1. 18 is what part of 36?

(a) \$1 is what part of \$36?

(b) \$18 is 18 times  $\frac{1}{36}$  or  $\frac{18}{36}$ .

(c)  $9\frac{18}{36} = 2\frac{2}{4} = \frac{1}{2}$ . *Ans.*

18 is  $\frac{1}{2}$  of 36.

2. 24 is what part of 72?

3. What part of 42 is 28?

4. 20 qt. is what part of a bushel?

5. Mr. Melvin divided \$12 equally among 20 children.

What fractional part of \$1 did each child receive?

6. If 24 oranges cost 18¢, how much will 1 cost?

7. A grocer bought 144 boxes of breakfast food, and sold 132 boxes. What part did he sell? What part had he left?

8. If you earn \$45 a month and spend \$40, what part of your earnings do you spend? What part remains?

## LESSON 25

## ORAL

1. 5 is what part of 30?
2. If I have \$36 and spend \$12, what part of my money do I spend?
3. A man starts to walk 40 miles. When he has gone 16 mi., what part of the distance has he covered?
4. Write four hundred thousand four hundred four.
5. I had \$7 left after spending \$6 and \$14. How much had I at first?
6. Multiply the sum of 4 and 9 by their difference.

## WRITTEN

1. I had \$630 and spent \$120. What fractional part of my money did I spend?
2. In a school there were 1280 children. 240 were absent. What fractional part was present?
3. In an orchard were 180 trees. 60 of them were apple trees. What part of the orchard was apple?
4. A man's salary was \$1250. He saved \$250. What part of his salary did he save?
5. A ship had 900 miles to travel. It went 250 miles. What part of the journey had it gone?
6. Out of 80,000 bu. of grain in a ship's cargo, 35,000 bu. were damaged by water. What part was not damaged?
7. Add eight hundred sixty-nine thousand four hundred eighty-nine; one thousand five hundred; thirty-two thousand nineteen.
8. Add the following numbers and write the answer in words. 10,486,976; 84,028; 44,109,600; 8004.
9. What will be the cost of a tub of butter weighing  $35\frac{5}{8}$  lb. @ 32¢ a pound.
10. From the sum of  $15\frac{2}{3}$  and  $27\frac{4}{5}$  take  $19\frac{1}{2}$ .

## LESSON 26

## ORAL

1. A merchant sells 16 cans of beans from a case containing 24 cans. What part of the case was sold?

2. If a boy spends 15¢ of 20¢, what part of his money does he spend?

3. How many pounds of sugar, @ 6¢ a pound, can be bought for \$1.20?

4. If 5 lb. of rice cost 45¢, what will 8 lb. cost at the same rate?

5. What part of 32 is 12?

6. Reduce  $\frac{48}{60}$  to lowest terms.

## WRITTEN

1. A man had \$4850 in the bank. He drew out \$1250. What part was drawn out?

2. A farmer raised 480 bu. of oats. He sold 120 bu. What part did he sell?

3. There was clear weather on 140 days of a year. What part of the year was clear?

4. 250 lb. is what part of a ton of coal? (A ton weighs 2000 lb.).

5. A street is 880 yd. long. What part of a mile is its length?

6.  $24 \times 18 \times 60 \times 12 \div$  by  $12 \times 24 \times 15 \times 9 = ?$

7. To the difference between  $6\frac{3}{4}$  and  $3\frac{5}{7}$  add  $7\frac{1}{4}$ .

8. A druggist sells perfumery @ 15¢ per bottle. If each bottle holds 1 gi., how much will he receive for 2 qt. of perfume?

9. If 25 lb. of sugar cost \$1.50, what will 60 lb. cost at the same price per pound?

10. The telephone paid \$600 for 75 poles. How many could they buy for \$912, at the same rate?

## LESSON 27

## ORAL

1. A boy takes part in 16 races. If he wins 12 of them, what part of his races does he lose?

2. The cost of a bicycle is \$25. When a boy has saved \$15, what part of the cost of the bicycle has he saved?

3. Reduce  $\frac{15}{50}$  to lowest terms.

4.  $\frac{3}{11}$  of 77 = ?

5. Add  $3\frac{1}{5}$  and  $4\frac{9}{10}$ .

6. From  $1\frac{1}{2}$  take  $\frac{5}{6}$ .

## WRITTEN

1. A man had \$810 in the bank. He drew out \$18. What part had he left in the bank?

2. A farmer raised 488 bu. of corn. He sold 100 bu. What part of his crop had he left?

3. A dealer sold 1000 head of cattle. One packing house bought 250 of them. What part was sold to the others?

4. Two men paid \$900 for a team of horses and a truck. If one of them paid \$189, what part of the cost did the other man pay?

5. A pole was 45 ft. long, 10 ft. were placed in the ground. What part was in the air?

6. Add  $44\frac{3}{5}$ ,  $89\frac{5}{8}$  and  $9\frac{3}{4}$ .

7. From 900 take  $486\frac{5}{4}$ .

8. Multiply  $5\frac{5}{8}$  by  $3\frac{4}{9}$ .

9. A floor containing 18 sq. yd. is 16 ft. long. How wide is it?

10. By selling 24 coats @ \$15 each, a merchant gained \$72. How much had they cost him apiece?

## LESSON 28

## ORAL

1. One quart is what part of one bushel?
2. How many rods in one mile?
3. Some men have 30 ft. of trench to dig. After digging 10 ft., what part remains to be dug?
4. Find  $\frac{1}{4}$  of 160.
5. A boy bought magazines @ 3¢ each and sold them @ 5¢ each. If he made 30¢, how many magazines did he sell?
6. How many square yards in 45 sq. ft.?

## WRITTEN

1. A man had \$4000. He paid \$3750 for a house. What part of his money has he left?
2. What part of 2 bu. is 18 quarts?
3. 144 rd. is what part of 3 mi.?
4. From a barrel containing 45 gal., 30 gal. were drained out. What part was drained out? What part was left?
5. A roll of carpet contained 150 yd. After 65 yd. had been sold, what part of the roll was left?
6. A bucket containing  $6\frac{3}{4}$  qt. was filled  $4\frac{1}{2}$  times from a barrel. How many quarts were taken from the barrel?
7. A dealer had 47 bu. of potatoes. He sold  $\frac{1}{4}$  of them @ \$.60 per bushel. How much did he receive?
8. Add \$6.47, \$45, \$9.38, \$.65, \$8.58, \$66, \$7.64.
9. How many square yards are there in a lawn 171 ft. long and 144 ft. wide?
10. A man bought some land @ \$12 per acre and sold it for \$18 per acre. He gained \$480. How much did he pay for all the land?

## REVIEW VII

1. A grocer bought 54 cases of soup, each containing 24 cans. He sold 16 cans on Monday, 160 cans on Tuesday, 5 cases on Wednesday, and 520 cans on Thursday. What part of his stock remained unsold?

2. If a farm is sold for \$9163, @ \$245 an acre, how many acres are there?

3. 60 oz. is what fractional part of 5 lb.?

4. There are 2 yards, one 24 ft. by 30 ft. and the other 28 ft. by 4 ft. What is the difference in the area of the two yards?

5. I had \$140. I spent \$92. What part of my money had I left?

6. A dealer bought peaches @ 40¢ a basket and sold them @ 75¢ a basket. In one day he gained \$8.40. How many baskets did he sell?

7. From a barrel of vinegar, containing 24 gal., 19 qt. were sold. What part was sold?

$$8. 6\frac{2}{3} + 4\frac{5}{9} - 3\frac{3}{5} = ?$$

9. In a store there were sold 200 yd. of gingham @ 18¢ per yd., 150 yd. @ 20¢, and 60 yd. @ 26 $\frac{2}{3}$ ¢. What was the average selling price?

10. A picture dealer made a profit of \$56 on 16 pictures, which he sold @ \$12 each. What was the cost of each picture to the dealer?

## ADDITION DRILL II

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>
58	56	78	79	7584	4659	8769
69	97	92	68	3745	2390	4536
34	83	86	49	2859	456	2934
26	87	61	87	4637	3427	65
91	24	86	51	3167	987	3429
28	79	27	37	9516	3876	453
75	29	49	13	3908	2131	3998
63	27	68	66	7685	3420	4352
48	17	24	98	1711	5690	1212
83	49	87	38	6875	658	657
92	13	33	62	2321	3425	2390
76	37	96	37	2136	657	4531
—	—	—	—	—	—	—
69	57	64	98	7685	4568	8796
87	62	14	37	1234	4530	6453
83	85	36	73	7685	3412	3428
79	29	24	87	2432	768	564
12	64	96	64	7564	3425	4657
39	49	67	46	2435	769	233
71	81	23	87	2131	2341	657
42	78	72	55	3141	6453	4536
65	32	34	55	5196	8790	9786
38	51	57	91	4095	4531	5647
91	45	95	19	6709	123	909
42	57	36	99	6110	5678	114
—	—	—	—	—	—	—

ADDITION DRILL—*Continued*

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>
62	87	74	75	4536	5647	7658
43	78	88	35	2435	9800	2435
96	31	42	98	8790	768	4536
85	48	29	48	879	1213	6758
19	79	31	62	6875	65	2134
82	53	83	79	5647	5462	4567
57	35	17	21	210	8760	342
36	59	70	79	5768	6808	564
84	53	12	75	490	2432	2439
39	86	64	35	555	657	980
23	36	89	83	5649	3540	5069
65	24	41	27	560	4521	3541
—	—	—	—	—	—	—

## TYPE XIII

## TO FIND WHAT FRACTIONAL PART A FRACTION IS OF AN INTEGER

1.  $\$ \frac{1}{2}$  is what part of \$3?

$\frac{1}{3}$  is the fractional part.

Since the denominator 3 represents the finding of  $\frac{1}{3}$  of the number, we may simplify this fractional part by finding  $\frac{1}{3}$  of  $\frac{1}{2}$ , which is  $\frac{1}{6}$ .

$$\frac{\frac{1}{2}}{3} = \frac{1}{3} \times \frac{1}{2} = \frac{1}{6}.$$

2.  $\frac{3}{4}$  is what part of 5?

$$\frac{\frac{3}{4}}{5} = \frac{1}{5} \times \frac{3}{4} = \frac{3}{20}. \quad \text{Ans.}$$

3.  $\frac{7}{8}$  is what part of 2?

4.  $\frac{9}{10}$  is what part of 6?

5.  $\frac{1}{5}$  is what part of 3?

6. A father changed a \$5 bill, and gave his son  $\$ \frac{3}{4}$ .

What part of the money did the son receive?

7.  $\frac{5}{8}$  of a bu. is what part of 10 bu.?

8. A merchant sold  $\frac{3}{4}$  yd. of ribbon from a piece containing 6 yd. What part of the piece did he sell?

## LESSON 29

## ORAL

1. What is  $\frac{1}{3}$  of 12 seventeenths?
2. Find  $\frac{1}{4}$  of  $\frac{8}{11}$ .
3. How many square feet in  $2\frac{1}{3}$  sq. yd.?
4. A carpenter saws 9 ft. from a 12-ft. board. What part of the board is left?
5. How many square inches in  $\frac{1}{12}$  of a square foot?
6. If a grocer puts one pound of 30¢ coffee with one pound of 20¢ coffee, what is one pound of the mixture worth?

## WRITTEN

1.  $\frac{4}{5}$  is what part of 12?
2.  $\frac{63}{100}$  of a square foot is what part of a square yard?
3. Three boys gathered  $\frac{1}{8}$  bu. of nuts. If each gathered the same amount, what part of a bushel did each boy gather?
4.  $\frac{6}{10}$  of a pie is cut into 3 equal pieces. How much of the pie is there in each piece?
5. A father left  $\frac{1}{4}$  of his estate to be divided equally among his 8 children. What part of the estate did each receive?
6. What part of a square foot is 108 sq. in.?
7. There were 440 plants in a garden, 240 of them were flowers. The rest were vegetables. What part were vegetables?
8. A speculator bought 18,000 bu. of potatoes @ 65¢ per bushel. He sold  $\frac{1}{2}$  of them @ \$.72 a bushel,  $\frac{1}{3}$  @ \$.76 a bushel, and the remainder @ \$.90 a bushel. How much was his profit?
9. Mr. Forest buys 40 sheep @ \$3.75 a head and 35 sheep @ \$3 a head. What is the average price paid?
10. Write in Roman numerals, 666, 405, and 999.

## LESSON 30

## ORAL

1. Find  $\frac{1}{3}$  of  $\frac{9}{10}$ .
2. 18 is what part of 27?
3. How many pecks in  $3\frac{1}{2}$  bu.?
4. If you have 50¢ and spend 20¢ for candy, what part of your money is left?
5. At 24¢ a pound, what is the cost of  $1\frac{1}{4}$  lb. of meat?
6. One girl has 16¢, which is 5¢ more than another girl has. How much money have both girls?

## WRITTEN

1.  $\frac{8}{9}$  yd. of cloth was cut from a piece containing 24 yd. What part of the piece was cut off?
2. An order of lamb chops weighed 15 lb. Each chop weighed  $\frac{5}{16}$  of a pound. (a) What part of the order was each chop?  
(b) What is the cost of each chop @ 32¢ a pound?
3. Eight yards of calico was cut into pieces, each  $\frac{4}{5}$  of a yard long. What part of the whole was each piece?
4. I had 6 tons of coal in my bin. I have burned  $1\frac{8}{5}$  of a ton. What part of the coal has been burned?
5.  $\frac{3}{4}$  of a barrel of potatoes was divided among 9 families. What part of the barrel did each receive?
6. To make a suit of clothes valued at \$40, a tailor spent \$18 for material and \$12 for labor. What part of the value is paid for material and labor?

**LESSON 30**—*Continued*

7. Lumber is worth \$60 per 1000 feet. What part of 1000 ft. can I buy for \$45?

8. A team of horses eats  $5\frac{1}{4}$  bu. of oats in a week. How many bushels will they eat in  $4\frac{3}{7}$  weeks? How many pecks? How many quarts?

9. A man owed \$217. He paid \$126 on the debt. What part of the debt does he still owe?

10. A. has  $\$64\frac{1}{2}$ , which is  $\$37\frac{4}{5}$  more than B. has. How much money have both?

## TYPE XIV

TO FIND WHAT PART A MIXED NUMBER IS OF A WHOLE  
NUMBER

1.  $3\frac{1}{2}$  is what part of 7?

$$\frac{3\frac{1}{2}}{7} = \frac{1}{7} \text{ of } 3\frac{1}{2} = \frac{1}{7} \times \frac{7}{2} = \frac{1}{2}. \quad \text{Ans.}$$

2.  $4\frac{2}{3}$  is what part of 7?

3. A piece of rope  $2\frac{2}{3}$  ft. long was cut from a piece 12 ft. long. What part of the rope was cut off?

4.  $3\frac{1}{3}$  in. is what part of one foot?

5. A man paid  $\$2\frac{1}{4}$  for a hat. If he had \$10, what part of the money did he spend for the hat?

6. A merchant makes a profit of  $\$4\frac{1}{4}$  on an article that cost him \$34. What part of the cost does he gain?

7. The cost of making a book is 60¢. If the paper cost  $7\frac{1}{2}$ ¢, what part of the cost of the book was spent for paper?

8.  $3\frac{2}{3}$  oz. is what fractional part of a pound?

## LESSON 31

## ORAL

1. How many quarts are there in  $5\frac{1}{4}$  gal.?
2. If 5 yd. of cloth cost  $\$1\frac{0}{4}$ , what will 1 yd. cost?
3. 8 eggs is what part of a dozen?
4. 2 sq. ft. is what part of a 2-foot square?
5. How many pounds of sugar @ 6¢ per pound are worth as much as 2 lb. of butter @ 30¢ a pound?
6. If I sell 4 chairs for \$24, and gain \$8, what did each chair cost me?

## WRITTEN

1. The water in a tank containing 15 gal. was poured into smaller tanks, each containing  $3\frac{3}{4}$  gal. What part of the whole quantity did each tank contain?
2. A man earns \$36. His son earns  $\$4\frac{1}{2}$ . What part of the father's wages are the wages of the son?
3. A grocer bought 40 bbl. of flour, and sold  $24\frac{3}{8}$  bbl. What part of the flour has he sold?
4. A piece  $6\frac{1}{2}$  ft. long was cut from a telephone pole 42 ft. long. What part of the pole was left?
5. One man earns  $\$26\frac{2}{3}$  per week. Another earns \$30 per week. What fractional part is the first man's earnings of the second man's?
6. Out of 6 doz. eggs, 16 were spoiled. What part were spoiled?
7. A painter starts to varnish a floor 16 ft. long and 24

**LESSON 31**—*Continued*

ft. wide. When he has finished 40 sq. ft., what part has he still to do?

8. From 6 pieces of cloth, each containing 24 yd., worth \$3 per yard, how many suits can be made worth \$18 a suit? (Cancellation.)

9. A newsboy sold 84 papers @ 2¢ each and thereby gained 42¢. At what price each did he buy the papers?

10.  $840,609 \div 409 = ?$

## LESSON 32

## ORAL

1. If 10 lb. of coffee costs \$3, what is the cost per pound?
2. If there are 3 oz. of fat in each pound of meat, what part of the meat is not fat?
3. Which is greater, and how much,  $\frac{4}{5}$  or  $\frac{1}{15}$ ?
4. What is the quotient when the divisor is 9 and the dividend is 100?
5.  $\frac{25 \times 30}{5 \times 6} = ?$
6. Find  $\frac{1}{8}$  of  $\frac{16}{25}$ .

## WRITTEN

1. Forty pounds of candy were placed in boxes, each containing  $2\frac{1}{2}$  lb. What part did each box contain, and how many boxes were needed?
2. A bag of coal weighs  $37\frac{1}{2}$  lb. What part of 100 lb. is a bag?
3. A farmer raised  $82\frac{1}{2}$  bu. of wheat. His neighbor raised 110 bu. What part of the second was the first farmer's crop?
4. What part of 40 is  $27\frac{2}{5}$ ?
5. What fractional part of a barrel of flour (196 lb.) has been consumed when 147 lb. are left?
6. What part of  $66 \times 18 \times 24 \times 25$  is  $84 \times 25 \times 7 \times 30$ ?
7. What will be the cost of 86 oz. of meat @ 24¢ per pound?
8. Find the cost of 6 bags of meal, of  $6\frac{1}{4}$  lb. each, @ \$.02 per pound?
9. If 5 be added to both terms of the fraction  $\frac{7}{8}$ , will its value be increased or diminished? By how much?
10. Divide the product of 84 and 670 by the product of 1005 and 40.

## REVIEW VIII

1. A piece of carpet containing  $\frac{3}{4}$  of a square yard was made into 4 chair seats. What fractional part of a square yard was in each piece?

2. A bin contained 6 bu. of corn. A measure contained 12 qt. What part of the whole quantity did the measure contain? How many times can the measure be filled from the bin?

3.  $2\frac{5}{16}$  is what part of 94?

4. (a) Change from Roman to Arabic, LXIV; CXCIH.

(b) Change from Arabic to Roman, 1492; 146; 74.

5. Find the cost of paving a stable yard 26 ft. long by 45 ft. wide, @ \$1.75 a square yard.

6. From a stock of 36,000 lb. of copper I sold  $\frac{2}{3}$  at \$.18 a pound,  $\frac{1}{8}$  at \$.22,  $\frac{1}{4}$  at \$.20, and the remainder at \$.19. What was received for the entire quantity?

7. At the beginning of the season Spaulding & Co. bought 50 doz. golf balls. They sold 480 of them in one week. What part of the stock remained?

8. A newsman's sales for the week were as follows: Sunday, 300 @ 7¢; Monday, 420 @ 2¢, and 120 @ 1¢; Tuesday, 300 @ 2¢, and 200 @ 1¢; Wednesday, 440 @ 2¢, and 400 @ 1¢; Thursday, 380 @ 2¢, and 350 @ 1¢; Friday, 470 @ 2¢, and 450 @ 1¢; Saturday, 600 @ 2¢, and 750 @ 1¢. Find the average amount of his daily sales.

9. 18 lb. of spices were put up in 2-oz. packages, which sold at 10¢ each. If the spice cost \$8.00, what was gained?

10. Divide  $56 \times 24 \times 25 \times 16$  by  $12 \times 35 \times 21 \times 32$ .

## MULTIPLICATION DRILL

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
2345 <u>×456</u>	2314 <u>×361</u>	2581 <u>×868</u>	1597 <u>×345</u>	5943 <u>×789</u>
1354 <u>×564</u>	2465 <u>×265</u>	3859 <u>×284</u>	3069 <u>×576</u>	3792 <u>×583</u>
4532 <u>×654</u>	7342 <u>×234</u>	4672 <u>×824</u>	6583 <u>×798</u>	3786 <u>×534</u>
2165 <u>×356</u>	3705 <u>×456</u>	8354 <u>×863</u>	9273 <u>×364</u>	7015 <u>×675</u>
1432 <u>×653</u>	1475 <u>×687</u>	9768 <u>×324</u>	2591 <u>×675</u>	5197 <u>×897</u>
2435 <u>×536</u>	2387 <u>×915</u>	9612 <u>×654</u>	9378 <u>×467</u>	6978 <u>×573</u>
3216 <u>×453</u>	4956 <u>×951</u>	3692 <u>×786</u>	2864 <u>×453</u>	7963 <u>×386</u>
2341 <u>×426</u>	2861 <u>×519</u>	3827 <u>×736</u>	2408 <u>×756</u>	5874 <u>×659</u>
3245 <u>×356</u>	5189 <u>×432</u>	5964 <u>×637</u>	7492 <u>×978</u>	1643 <u>×347</u>
1324 <u>×236</u>	4089 <u>×564</u>	6485 <u>×953</u>	8945 <u>×459</u>	4653 <u>×631</u>

## TYPE XV

## TO FIND THE AREA OF LAND IN ACRES

Teach that 160 sq. rd. = 1 A.

1. A field 40 rd. long and 20 rd. wide contains how many A.?

$$40 \text{ sq. rd.} \times 20 = 800 \text{ sq. rd.}$$

$$1 \text{ A.} = 160 \text{ sq. rd.}$$

$$160 \overline{)800} \begin{array}{r} 5 \\ 80 \end{array} \quad \text{or} \quad \begin{array}{r} 5 \\ 40 \times 20 \\ 160 \\ \hline 4 \end{array} = 5 \quad \therefore \text{Ans. } 5 \text{ A.}$$

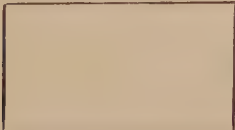
2. Find the area in acres of a field 18 rd. long and 16 rd. wide.

3. How many A. are there in a field 80 rd. square?

4. A farm is 100 rd. long and 30 rd. wide. How many A. does it contain?

5. Find the area in acres of a strip of land 2 mi. long and 4 rd. wide.

6. In a field 300 rd. long and 3 rd. wide, how many A. are there, and how many square rods left over?

7.  Find the area in acres and square rods.

8. At \$500 per acre, find the value of a field 40 rd. long by 20 rd. wide.

## LESSON 33

## ORAL

1. How many square rods are there in 1 acre?
2. How many square rods are there in a field 8 rd. long by 12 rd. wide?
3. If a board 6 in. wide contains 600 sq. in., how long is it?
4. How many feet are there in a rod?
5. A bushel of apples, costing \$1, is sold at 40¢ a peck. What is the gain?
6. What number will exactly contain 11 eleven times?

## WRITTEN

1. How many acres are there in a field 24 rd. long and 20 rd. wide?
2. What must I pay for a farm which measures 22 rd. by 100 rd. at \$25 per acre?
3. Find the area in acres of a field 112 rd. long by 44 rd. wide.
4. A farmer sold  $\frac{1}{2}$  of his farm for \$300 an acre. If his farm contained originally 1200 sq. rd., how much did he receive for the part sold?
5. A field containing 4 A. is 32 rd. long. How wide is it?
6. What part of an acre is 15 sq. rd.?
7. A yard of cloth cost  $\$2\frac{1}{2}$ . I paid for it with a \$2 bill. What part of the \$2 did the cloth cost?
8. How many feet are there in 20 rd.?
9. I buy 116 bu. of potatoes at 85¢ a bushel, and sell them at 30¢ a peck. How much do I gain?
10. Of what number is 406 both the divisor and the quotient?

## LESSON 34

## ORAL

1. A garden plot contains 80 sq. rd. What part of an acre does it contain?
2. Find the cost of 20 bu. of potatoes at  $\$1\frac{1}{4}$  per bushel.
3.  $16\frac{1}{2} - 9\frac{3}{8} = ?$
4. If I sell an article for \$8 that cost me \$6, what part of the cost do I gain?
5. A man bought 3 cows for \$40, \$50, \$60, respectively. What was the average price paid for the cows?
6.  $\frac{5\frac{1}{2} + 8\frac{1}{2}}{16} = ?$

## WRITTEN

1. Find the number of acres in a farm 125 rd. square.
2. Find the length of a field which is 40 rd. long and which contains 8 A.
3. B. sold a field which was 16 rd. long and 24 rd. wide to A. for \$145 an acre. What did A. pay for it?
4. At \$120 an acre, how many square rods can be bought for \$90?
5. A field 20 rd. by 10 rd. is what part of 3 acres?
6. In one day a man walks  $16\frac{1}{4}$  mi. How far will he walk in  $12\frac{1}{2}$  da. at the same rate?
7. A man's wages for a month were  $\$200\frac{1}{4}$ . He spent  $\$75\frac{1}{2}$ ,  $\$29\frac{3}{5}$ , and  $\$18\frac{3}{4}$ . How much had he remaining?
8. Add  $9\frac{3}{16}$  and  $2\frac{7}{4}$ , and find what part the sum is of 100.
9. A tailor sold a suit of clothes for \$35. The suit cost him \$28 to make. What fractional part of the cost did he gain?
10. The attendance for a class for 1 week was as follows: Monday, 44; Tuesday, 48; Wednesday, 45; Thursday, 46; and Friday, 42. Find the average daily attendance.

## LESSON 35

## ORAL

1. How many square rods are there in 10 A.?
2. Change 5 to 16ths.
3. Change  $\frac{32}{48}$  to lowest terms.
4. What part of 64 is 16?
5. If a boy buys 50 marbles @ 1¢ each and sells them so as to gain \$1.00, for what does he sell the marbles?
6. What are the prime factors of 50?

## WRITTEN

1. Find the number of square rods in  $185\frac{1}{2}$  A.
2. A field 64 rd. square was sold for \$400 per acre. Find the amount received for it.
3. A piece of ground 10 rd. square is what part of 1 acre?
4. A map is drawn to a scale of 30 mi. to the inch. Two cities are  $3\frac{1}{2}$  in. apart on the map. How many miles apart are they?
5. Reduce to lowest terms  $\frac{32}{256}$  and  $\frac{96}{100}$ .
6. A train goes from New York to Albany (144 mi.). When it has traveled 32 mi., what part of its journey is completed?
7. A man bought 840 bbl. of flour @ \$4.60 a barrel, and sold it so as to gain \$1848. What was the selling price per barrel?
8. Find all the prime factors of 1764.
9. What must a woman pay for  $18\frac{1}{5}$  yd. of carpet at  $\$2\frac{3}{4}$  per yard?
10. From a flock of 185 sheep a man sold 74. What part of his flock was left?

## LESSON 36

## ORAL

1. How many acres in a field 16 rd. long and 10 rd. wide?
2. How many yards in one mile?
3. A grocer bought 200 lb. of sugar and sold  $\frac{1}{4}$  of it. How many pounds were left?
4. 3 qt. is what part of 2 gal.?
5. Add XII and IX.
6.  $\frac{45 \times 16}{8 \times 9} = ?$

## WRITTEN

1. Mr. Marks bought four fields adjoining his farms. One measured 10 rd. by 14 rd. and another 16 rd. by 20 rd.; a third contained  $16\frac{1}{2}$  A., and the fourth was 8 rd. by 15 rd. He paid \$300 an acre. How much did the four fields cost him?
2. From a field 24 rd., by 30 rd., a piece was sold which contained 4 A. What part was sold? What part remained?
3. What part of 33 ft. is 1 rd.?
4. A railroad bought a strip of land,  $16\frac{1}{2}$  ft. wide and 40 rd. long, from a farm for a right of way. They paid for it at the rate of \$900 per acre. Find the cost.
5. How many feet are there in  $\frac{2}{3}$  of a mile?
6.  $\frac{3}{4}$  of the children on registration in a school are present. If the register is 2576, how many are absent?

**LESSON 36**—*Continued*

7. Write the numbers represented by CMIX, DCCCLXXVII.

8. From a cask of oil containing 24 gal., 16 quarts were sold at one time, 20 quarts at another time and 8 gal. at another time. What fractional part of the whole was left in the cask?

9.  $\frac{8 \times 18 \times 45 \times 64}{4 \times 27 \times 32 \times 57} = ?$

10. Divide 48,532 by 204 and multiply the remainder by 100.

## REVIEW IX

1. What is the value of a piece of land 48 rd. by 32 rd.

@ \$250 an acre?

2. How many feet long is a trench 32 rd. in length?

3. Dividend is 160,752; quotient, 394. Divisor?

4. From a field containing 24 A., 192 sq. rd. were sold.

What part of the field remained?

5. Find all the prime factors of 10,296.

6. How many quarts are there in  $16\frac{2}{3}$  times  $1\frac{1}{2}$  bu.?

7. How long is a field 35 rd. wide, if it contains 9 A.

135 sq. rd.?

8. (a)  $24\frac{3}{4}$  is what part of 110?

(b) Change to lowest terms  $\frac{48}{216}$  and  $\frac{81}{402}$ .

9. A tailor bought 400 yd. of cloth @ \$3.50 per yard.

From it he made up 50 suits, which he sold @ \$40 a suit.

The labor cost him \$300. How much did he gain?

10. Find the value of  $15\frac{3}{4}$  bbl. of apples, each containing  $2\frac{1}{2}$  bu., @  $\$1\frac{2}{5}$  a bushel.

## RAPID FACTOR DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Start and stop on the teacher's signal. Write for 5 minutes. Score 5 for each correct answer. Keep a record of results and compare with subsequent trials. Note improvement in speed and accuracy.*

A	B	C	D
12) <u>132</u>	$8 \times ? = 72$	$16 \times 5 = ?$	$144 \div 6 = ?$
?	<u>? ) 90</u>	<u>4 ) 96</u>	<u>3 ) 81</u>
$? \times 2 = 62$	18	?	?
$\frac{1}{8}$ of 24 = ?	$22 \times 3 = ?$	$? \times 10 = 120$	$? \times 6 = 54$
$108 \div 9 = ?$	$? \times 9 = 144$	$\frac{1}{5}$ of 95 = ?	$36 \div ? = 3$
$75 \div 3 = ?$	$98 \div 14 = ?$	$21 \times ? = 84$	$4 \times ? = 96$
<u>? ) 91</u>	<u>13 ) 78</u>	<u>? ) 63</u>	<u>? ) 84</u>
13	?	7	6
$46 \times 2 = ?$	$? \times 3 = 81$	<u>7 ) ?</u>	$7 \times 9 = ?$
<u>4 ) ?</u>	$\frac{1}{3}$ of 99 = ?	7	$49 \div 7 = ?$
19	$94 \div ? = 47$	$? \div 4 = 16$	$? \times 4 = 64$
$? \div 5 = 13$	$18 \times ? = 54$	$56 \div 4 = ?$	$\frac{1}{4}$ of 56 = ?
$52 \div 13 = ?$	<u>? ) 100</u>	<u>3 ) 42</u>	$42 \div 6 = ?$
<u>7 ) 77</u>	10	?	$12 \times ? = 132$
?	$4 \times 17 = ?$	$? \times 11 = 132$	<u>? ) 108</u>
$? \times 11 = 121$	<u>4 ) ?</u>	$\frac{1}{3}$ of 108 = ?	9
$\frac{1}{2}$ of 82 = ?	9	$11 \times ? = 121$	
$93 \div ? = 31$	$? \div 11 = 10$	$18 \times 4 = ?$	

## REVIEW C

1. 24 da. is what part of a month?
2. Pencils were bought at 5¢ a dozen. How much is that apiece?
3. Add 98,764; 295,897; 693,879; 18,976; 389,792; 7698.
4. Multiply the sum of 987 and 379 by the difference between 823 and 579.
5. Add  $65\frac{2}{3}$ ,  $59\frac{6}{7}$ ,  $87\frac{1}{2}$ , and  $94\frac{5}{6}$ .
6. A man having \$648, spent \$445.50. What part did he spend?
7. How many square yards are there on a floor 51 ft. long and 42 ft. wide?
8. A dealer bought 756 tons of coal. He sold  $\frac{4}{9}$  of it at \$4.50 a ton,  $\frac{1}{6}$  of it @ \$4, and  $\frac{2}{7}$  of it @ \$4.25. How much did he receive for all of it and how many tons had he left?
9. A rug. 9 ft. by 12 ft. takes up what part of a floor 15 ft. by 12 ft.?
10. Divide 1,815,422 by 658.
11. What part of  $63 \times 64 \times 69 \times 72 \times 91$  is  $42 \times 52 \times 81 \times 96 \times 92$ ?
12. Find the cost of 2 lb. 6 oz. of butter at 40¢ a pound and 7 lb. 12 oz. of meat at 20¢ a pound.
13. How many acres are there in a field 64 rd. long and 55 rd. wide?
14. If I buy 75 bu. of potatoes at 60¢ a bushel and sell them at 5¢ a quart, how much do I gain?

REVIEW C—*Continued*

15. Of what number is 79 both the divisor and the quotient?

16. A train ran at a speed of  $43\frac{3}{4}$  mi. per hour for  $2\frac{2}{3}$  hr. How far did it run?

17. A plot of ground containing 30 A. was cut up into house lots, each containing 36 sq. rd. How many lots were there?

18. Find the prime factors of 4158.

19. Find the product of  $234 + 685$  and  $921 - 389$ .

20. From  $324\frac{1}{8}$  take  $187\frac{5}{8}$ .

21.  $7\frac{1}{2}$  mo. is what part of a year?

22. A dealer who had 4032 bu., sold  $\frac{4}{7}$  of them to one,  $\frac{1}{8}$  to another,  $\frac{1}{6}$  to another, and  $\frac{1}{9}$  to another. How many bushels had he left?

23. A man who owned 4 A. of land, sold a strip 4 rd. long and  $16\frac{1}{2}$  ft. wide. What part of his land did he sell?

24. Divide 1,498,780 by  $\frac{2}{3}$  of 822.

25. A field 35 rd. long contains 7 A. How wide is it?

26. There were 389 people on a train with tickets which had cost each one \$2.45. What were the total receipts for the company?

27. The total receipts of a company for 289 da. were \$45,872.97. What were the average daily receipts?

28. A man having \$521.35 in the bank, drew out \$78.50 and \$97.95. How much remained?

29. A traveler went at the rate of 18 mi. an hour for 6 da. How far did he travel?

30. Of what two numbers is 301 a multiple?

REVIEW C—*Continued*

31. How many pounds of candy will it take to fill 288 boxes, if each box contains  $\frac{1}{8}$  of a pound?

32. I bought 6 lamb chops, each weighing  $\frac{5}{8}$  of a pound, at 24¢ a pound. How much did I pay?

33. A broker bought shares at \$97 each. If he had \$15,000, how many shares did he buy and how much money had he left?

34. How many days are there in  $\frac{3}{5}$  of a year?

35. A man bought a box of lemons for \$2. He sold them at 21¢ a dozen. If there were 224 lemons in the box, how much did he gain?

36.  $\frac{2}{3} + \frac{6}{7} + \frac{5}{8} + \frac{7}{8} + \frac{3}{4} + \frac{4}{5} + \frac{1}{2} = ?$

37. Find the total cost of  $3\frac{1}{2}$  bu. @ 90¢,  $7\frac{3}{4}$  lb. @ 32¢,  $5\frac{1}{2}$  lb. @ 18¢,  $3\frac{1}{2}$  qt. @ 16¢, and  $12\frac{3}{8}$  yd. @ 24¢.

38. How many feet are there in  $2\frac{2}{3}$  mi.?

39. In a school of 2304 pupils, 120 were absent. What part were absent?

40. Subtract eight thousand seventy from ninety thousand one hundred one.

41. From  $\frac{3}{4}$  take  $\frac{2}{5}$ .

42. What will 27 in. of ribbon cost at 20¢ a yard?

43. Add \$16.34, \$25.01, \$37, \$1.02, \$.58, \$314.75, \$10.50.

44. By buying land at \$20 an acre and selling it at \$28 an acre, a man gained \$224. What did he pay for the land?

45. Out of 30 doz. eggs, 32 eggs were cracked. What part of the eggs were cracked?

REVIEW C—*Continued*

46. A boy sold 56 papers at 5¢ each, thereby gaining \$1.68. What did the papers cost him apiece?

47. 5 men weighed 176 lb., 191 lb., 168 lb., 187 lb., and 193 lb. Find the average weight.

48. Find the value of a piece of land 50 rd. by 48 rd. at \$75 an acre.

49. A county map covering an area 36 mi. long and 20 mi. wide is drawn to a scale of 1 in. to 2 mi. How long and wide is the map?

50. Find the cost to paint a wall 33 ft. long and 15 ft. wide at  $33\frac{1}{3}$ ¢ a square yard.

## DENOMINATE NUMBER DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Start and stop at the teacher's signal. Write for 5 minutes. Score 5 for each correct answer. Keep results and compare with subsequent trials. Note improvement in speed and accuracy.*

A	B	C
24 hr. = ?	1 pk. = ?	16 oz. = ?
? da. = 1 wk.	4 qt. = ?	1 bu. = ? qt.
144 sq. in. = ?	1 mi. = ? ft.	36 in. = ?
? sq. rd. = 1 A.	7 da. = ?	3 ft. = ?
$16\frac{1}{2}$ ft. = ?	32 qt. = ?	12 things = ?
60 min. = ?	160 sq. rd. = ?	365 da. = ?
5280 ft. = ?	9 sq. ft. = ?	? oz. = 1 lb.
? sq. in. = 1 sq. ft.	1760 yd. = ?	? qt. = 1 bu.
8 qt. = ?	? oz. = $\frac{1}{2}$ lb.	320 rd. = ?
28-31 da. = ?	? qt. = 1 gal.	? sq. ft. = 1 sq. yd.
1 hr. = ? min.	1 rd. = ? ft.	? ft. = 1 yd.
? yd. = 1 mi.	24 hr. = ?	4 oz. = ?
12 in. = ?	60 sec. = ?	1 yr. = ? mo.
? sec. = 1 min.	? pk. = 1 bu.	4 pk. = ?
2 pt. = ?	? rd. = 1 mi.	8 oz. = ?

*How do you change*

ft. to rd. ?	rd. to mi. ?	sq. ft. to sq. yd. ?
yd. to in. ?	oz. to lb. ?	qt. to gal. ?
pt. to gi. ?	pk. to bu. ?	ft. to in. ?
things to doz. ?	ft. to yd. ?	A. to sq. rd. ?
lb. to oz. ?	sq. rd. to A. ?	pt. to qt. ?
gi. to pt. ?	qt. to pt. ?	bu. to pk. ?
sq. ft. to sq. in. ?	in. to yd. ?	mi. to rd. ?
gal. to qt. ?	yd. to mi. ?	rd. to ft. ?
		sq. yd. to sq. ft. ?

## TYPE XVI

## TO FIND THE PERIMETERS OF SQUARES AND RECTANGLES

1. How many feet of fence needed to enclose a garden 68 ft. square?

A square has four equal sides.

Since the length of one side is 68 ft., it requires 4 times 68 ft., or 272 ft., to enclose the garden.



2. What will it cost to put a fence around a field 180 ft. square @  $3\frac{1}{2}\text{¢}$  a foot?

3. At 12¢ a foot, what will it cost to put a moulding around a room 15 ft. square?

4. What will it cost to fence a square plot of ground 150 ft. on a side at 8¢ a foot?

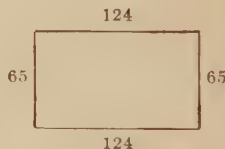
5. How many rods of fence are needed to enclose a field 124 rd. long and 65 rd. wide?

$$124 \text{ rd.} \times 2 = 248 \text{ rd.}$$

$$65 \text{ rd.} \times 2 = 130 \text{ rd.}$$

---

378 rd. Length of the fence.



6. At  $4\frac{1}{2}\text{¢}$  a foot what will it cost to put a wire fence around a field 19 ft. long and 17 ft. wide?

7. What will it cost to fence a field 26 ft. long and 32 ft. wide @ 24¢ a yard?

8. How many yards of wire are needed for a fence, four wires high, around a field 38 yd. long and 35 yd. wide?

## LESSON 37

## ORAL

1. How many feet of fence are needed to enclose a park 30 ft. square?
2. How many feet are there in 2 rd.?
3. Multiply  $\frac{4}{5}$  by 40.
4. How many minutes in one-half an hour?
5. What change should you give for a twenty-dollar bill, when the purchase amounts to  $\$15\frac{1}{4}$ ?
6. 25¢ is what part of 3 quarters of a dollar?

## WRITTEN

1. A city block is 200 ft. square. How many feet of curbing are needed to surround it?
2. A square park is 40 rd. on each side. How many rods of fencing will be needed to fence it? What will it cost at \$3.50 per rod?
3. At \$2.65 a rod, what will it cost to build a fence around a field 24 rd. on each side?
4. My chicken yard is 40 ft. long and 30 ft. wide. How many feet of fence will it take to go around it?
5. A house is 45 ft. long and 28 ft. wide. A gutter goes all around the roof. Find the cost of the gutter @ 12¢ a foot.
6. A man rode a bicycle  $\frac{1}{3}$  of a mile in a minute. How far will he ride in  $\frac{1}{4}$  of an hour at the same rate?

**LESSON 37**—*Continued*

7. From  $300\frac{1}{2}$  yd. of cloth a tailor cut  $22\frac{4}{5}$  yd.,  $35\frac{5}{6}$  yd., and  $19\frac{1}{3}$  yd. How many yards remained?

8. From the sum of  $18\frac{5}{9}$  and  $5\frac{3}{4}$ , take their difference.

9. A dealer bought 35 tons of coal for \$140 and sold it at a gain of 50¢ a ton. What part of the cost was the gain?

10. 640 A. make 1 square mile. If a park is 800 rd. long and 650 rd. wide, how many square miles are there in it? (Cancellation.)

## LESSON 38

## ORAL

1. At  $2\text{¢}$  a foot, find the cost of moulding to make a picture frame 3 ft. long and 2 ft. wide.
2. It takes 100 ft. of fence to enclose a square garden. What is the length of each side?
3. Two factors of 60 are 3 and 5. What is the other factor?
4. What part of the cost do I gain when I buy for \$10 and sell for \$14?
5. How many square rods in  $\frac{1}{10}$  A.?
6. Find  $\frac{1}{6}$  of 240.

## WRITTEN

1. It costs  $6\frac{1}{2}\text{¢}$  a foot to build a wire fence around a field 120 ft. by 48 ft. Find the total cost of the fence.
2. Find the cost of the picture moulding needed for a room 18 ft. long by 9 ft. wide at  $15\text{¢}$  per foot.
3. It is 168 ft. around a square field. What is the area of the field?
4. One side of a square field is 200 yd. long. How much will a stone wall around the field cost @  $40\text{¢}$  a foot?
5. A 4 wire fence is built around a yard 50 ft. by 40 ft. If the wire cost  $2\text{¢}$  a yard, what did the fence cost?
6. 2, 2, 5, and 7 are four factors of 1680. What is the other factor?
7. A jeweler buys a watch for \$60, which he sells for \$100. What part of the cost is his profit?

LESSON 38—*Continued*

8. Find the sum of fifty-two million three hundred ten thousand six hundred four; nineteen million three thousand seventy-seven; one million forty thousand four.

9. A farm is 400 rd. long by 344 rd. wide. 18 A. are sowed with clover, 24 A. are pasture land. The house plot is 10 rd. by 16 rd. and the rest is woodland. How many acres of woodland are there?

10. A man bought 85 yd. of cloth @  $15\frac{1}{2}$ ¢ a yard. He sold  $\frac{1}{4}$  of it @ 12¢ a yard,  $\frac{1}{2}$  of it @ 16¢ a yard, and the rest @ 1¢ a yard profit. Did he gain or lose and how much?

## LESSON 39

## ORAL

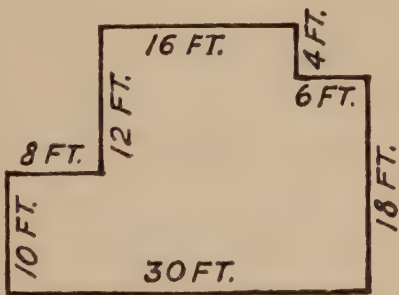
1. How many yards in 72 ft.?
2. A yard of ribbon is cut into pieces each 4 in. long. How many pieces were there?
3. The minuend is 45; the remainder is 16. What is the subtrahend?
4. How many 2-oz. packages of seed can be made from 3 lb.?
5. 4 qt. is what fractional part of a bushel?
6. How many plots, each containing 10 sq. rd., can be made from one acre of land?

## WRITTEN

1. Find the number of yards of wire fence needed to surround a plot of ground 36 ft. long and 33 ft. wide.

2. A garden plot is irregular in form, as follows: Find the distance around it.

3. How many boards 12 ft. long, placed end to end, will be required to enclose a square field 48 rd. on a side?



4. The difference between two numbers is 2,009,089. The minuend is 89,001,005. Find the subtrahend.

**LESSON 39**—*Continued*

5. A book agent bought 112 books @ \$3.20 each. He sold them @ \$4.90 each. If his expenses were \$75 and he could not collect the money for 4 books, how much did he gain or lose?

6. There are 100 lb. of phosphate in a bag. This is mixed with soil in which 800 plants are set. How many ounces of phosphate are supplied to each plant?

7.  $\frac{3}{4}$  of 1 bushel is what fractional part of 40 qt.?

8. The area of a field is 12 A. Its width is 20 rd. Find the length.

9. From a lot of land 40 rd. square, I sold 40 square rods. What is the remainder worth, @ \$120 an acre?

10. A railroad company fenced 8 mi. of its roads on both sides @  $67\frac{1}{2}$ ¢ a rod. What did it cost?

## LESSON 40

## ORAL

1.  $4500 \div 100 = ?$
2. How many feet in one rod?
3. How many square feet in a flower bed 10 ft. long and  $4\frac{1}{2}$  ft. wide?
4. Find the sum of  $3\frac{1}{2}$  and  $6\frac{1}{2}$ .
5. If a merchant buys 5 lb. of prunes @ 7¢ a pound and sells them so as to gain 15¢, what is the selling price per pound?
6. Write XCIV in Arabic figures.

## WRITTEN

1. A surveyor's tape is 100 ft. long. How many times must the surveyor use his tape in measuring a road 200 rd. long?
2. Privet plants are set 3 to a foot in building a hedge. How many plants will be needed to set a hedge 8 rd. long?
3. A reservoir is 24 rd. long and 330 ft. wide. How many square feet of surface are there in it?
4. Add  $19\frac{3}{4}$ ,  $17\frac{1}{2}$ , and  $18\frac{7}{8}$ .
5. From the sum of  $8\frac{1}{5}$  and  $9\frac{3}{4}$  take their difference.
6. A trolley car runs  $13\frac{1}{2}$  mi. per hour. How far will it run in 16 days, running  $14\frac{1}{2}$  hr. each day?
7. Add 4,096,231; 5,318,497; 30,809; 459,360; 3,651,748.
8.  $4064 \overline{)13,900,752}$ .
9. A merchant bought 27 yd. of cloth @ \$1.45 a yard, and sold it at a gain of \$4.05. What was the selling price per yard?
10. Write your birthday in Roman numerals, using them for the day, the month, and the year.

## REVIEW X

1. At  $2\text{¢}$  a foot, what will it cost for moulding to go around a room  $18\text{ ft.} \times 20\text{ ft.}$ ?

2. A man earned \$5.75 on Monday, \$8.50 on Tuesday, \$6.25 on Wednesday. He spent \$2.60 on Monday, \$1.90 on Tuesday, and \$3.75 on Wednesday. How much had he left?

3. A grocer bought flour @ \$6.50 a barrel and sold it at \$8.75. How much did he gain on 40 bbl.?

4. A team of oxen can plough a furrow 2 ft. long in a second. How many minutes will it take to plough around the outside of a field 200 ft. square?

5. A running track in a gymnasium is built around a rectangular enclosure  $70\text{ ft.} \times 40\text{ ft.}$  How many times around this track makes a mile?

6. A furniture dealer paid \$24 for a desk, which he sold for \$30. What part of the cost was gained?

7. Minuend,  $34,682\frac{1}{2}$ ; remainder,  $29,896\frac{5}{12}$ . Subtract?

8. On a floor  $18\text{ ft.} \times 14\text{ ft.}$ , there is a rug  $9\text{ ft.} \times 12\text{ ft.}$  The remainder of the floor is painted. How many square feet are painted?

9. A man sold 16 pairs of shoes for \$56, gaining \$14. How much did the shoes cost per dozen pairs?

10. What will be the cost of the oranges in 3 boxes, each containing 16 doz., @  $2\frac{1}{2}\text{¢}$  each?

## DIVISION DRILL II

<i>A</i>	<i>B</i>	<i>C</i>
562) <u>1,425,232</u>	127) <u>821,055</u>	317) <u>1,982,518</u>
316) <u>1,786,664</u>	207) <u>1,160,028</u>	931) <u>3,031,336</u>
136) <u>632,808</u>	623) <u>1,647,835</u>	734) <u>2,396,510</u>
614) <u>3,464,802</u>	543) <u>1,435,149</u>	418) <u>1,526,118</u>
732) <u>2,673,264</u>	824) <u>4,337,536</u>	239) <u>828,135</u>
923) <u>3,289,572</u>	415) <u>1,478,645</u>	825) <u>5,381,475</u>
218) <u>1,014,354</u>	327) <u>1,521,204</u>	417) <u>1,511,625</u>
451) <u>1,625,855</u>	521) <u>1,878,205</u>	238) <u>1,550,094</u>
613) <u>3,104,232</u>	225) <u>980,100</u>	821) <u>5,364,414</u>
532) <u>1,736,448</u>	634) <u>3,210,576</u>	526) <u>1,927,790</u>
741) <u>1,224,873</u>	832) <u>3,631,680</u>	328) <u>546,120</u>
932) <u>4,319,820</u>	416) <u>1,935,232</u>	934) <u>2,470,430</u>
437) <u>1,514,205</u>	219) <u>798,255</u>	531) <u>2,470,212</u>
153) <u>524,178</u>	823) <u>3,828,596</u>	318) <u>1,152,750</u>
514) <u>1,878,156</u>	625) <u>2,281,875</u>	913) <u>2,888,732</u>
117) <u>427,518</u>	319) <u>690,316</u>	635) <u>1,311,910</u>
813) <u>3,467,445</u>	924) <u>5,178,096</u>	419) <u>1,050,014</u>
624) <u>2,721,888</u>	716) <u>2,614,832</u>	534) <u>1,406,022</u>

## TYPE XVII

## REDUCTION OF TWO DENOMINATE UNITS

1. Reduce 40 yd. 3 ft. to feet.

$$1 \text{ yd.} = 3 \text{ ft.}$$

$$40 \text{ yd.} = 40 \text{ times } 3 \text{ ft.} = 120 \text{ ft.}$$

$$120 \text{ ft.} + 3 \text{ ft.} = 123 \text{ ft.}$$

2. Reduce 2 mi., 10 ft. to ft.  
3. How many pecks are there in 8 bu. 3 pk. ?  
4. How many quarts are there in 5 bu. 2 qt. ?  
5. Reduce 8 gal. 1 qt. to quarts.  
6. How many pint jars can be filled from 16 qt. 1 pt. ?  
7. Change 4 da. 8 hr. to hours.  
8. How many days are there in 3 wk. 3 da. ?  
9. In 40 lb. 10 oz., how many ounces ?  
10. 3 sq. yd., 6 sq. ft. = how many square feet ?

## LESSON 41

## ORAL

1. How many quarts in 9 gal.?
2. At  $\frac{1}{2}\text{¢}$  an inch find the cost of 2 ft. of wire.
3. One rod is what fractional part of a mile?
4. I paid \$45 for a bookcase, and  $\frac{1}{5}$  as much for a chair.

What did the chair cost?

5. If a merchant loses 9¢ when he sells 3 lb. of rice, which cost him 33¢, what is the selling price per pound?

6. How much change will be received from a ten-dollar bill when \$3.75 is spent?

## WRITTEN

1. Reduce 8 gal. 3 qt. to quarts.
2. What will 1 bbl. 10 gal. of vinegar cost @ 22¢ a gal.? ( $31\frac{1}{2}$  gal. = 1 bbl.)
3. At 30¢ a pint, how much will 3 qt. 1 pt. of alcohol cost?
4. Gold wire is 9¢ an inch. Find the cost of 2 ft. 9 in. of wire.
5. What is my bill for 4 yd. 2 ft. of moulding at 3¢ a foot?
6. How much will it cost me to build a wire fence 1 mi. 20 rd. long at 25¢ a rod?
7. A merchant invested \$12,000 in business. He lost  $\frac{1}{8}$  of it the first year, and  $\frac{1}{5}$  of the remainder the second year. How much has he left?

**LESSON 41**—*Continued*

8. A grocer bought 14 bags of coffee for \$142.24. It was damaged so that when it was sold, he lost \$30.10. How much did he sell it for per bag?

9. A woman goes shopping with \$20. She spends \$12 $\frac{1}{2}$  for a dress, \$4.75 for shoes, and \$1 $\frac{1}{4}$  for carfare and lunch. How much has she left?

10. What is the cost of binding the edge of a rug 4 yd. long and 3 yd. wide at 7 $\frac{1}{2}$ ¢ a foot?

## LESSON 42

## ORAL

1. How many pecks in 9 bu.?
2. Change 7 pk. to quarts.
3. How many ounces in  $\frac{5}{8}$  lb.?
4. How many yards of lace are needed to trim the edge of a tablecloth  $2\frac{1}{2}$  yd. square?
5. What is the least number that will exactly contain 5, 10, and 12.
6.  $\frac{20 \times 36}{9 \times 5} = ?$

## WRITTEN

1. Find how many quarts there are in 5 bu. 3 qt.
2. Change 18 pk. 3 qt. to quarts.
3. Beet seed costs 35¢ a pint. What will 3 qt. 1 pt. cost?
4. In 4 lb. 6 oz. of butter, how many ounces are there?
5. 18 oz. is what fractional part of 5 lb. 3 oz.?
6. At 20¢ per ounce, what must I pay for 2 lb. 5 oz. of spices?
7.  $347,625 + 489,506 + 786,342 + 379,988 + 537,586 + 320,985 = ?$
8. Find the cost of the baseboard for a room 16 ft. square @ 8¢ a foot.
9.  $73,645 \div 398 = ?$
10. At  $12\frac{1}{2}$ ¢ a yard, what will be the cost of  $5\frac{1}{3}$  yd. of cloth?

## TYPE XVIII

*A. Teach that in any series of operations, multiplications and divisions are to be performed before additions and subtractions.*

$$1. 7 + 6 \times 5 - 15 \div 3 = ?$$

$$6 \times 5 = 30$$

$$15 \div 3 = 5.$$

$$7 + 30 - 5 = 32. \quad \text{Ans.}$$

$$2. 20 - 20 \div 4 + 6 \times 5 = ?$$

$$3. 4 \times 5 + 45 \div 9 - 6 = ?$$

$$4. 8 \times 6 \div 4 + 40 \div 5 - 2 = ?$$

$$5. 25 + 36 - 6 \times 3 + 4 \times 7 = ?$$

*B. Teach that when part of the numbers in a series of operations are enclosed in a parenthesis, the operations in the parenthesis are to be performed first, then the other operations, as in the preceding type.*

$$(5+2) \times 6 + (5+10 \div 2) = ?$$

$$7 \times 6 + 10 = ?$$

$$42 + 10 = 52. \quad \text{Ans.}$$

$$1. (4+3-2) + (5 \times 6) = ?$$

$$2. (18 \div 9 + 6) + 20 \times (2+3) = ?$$

$$3. (12 \div 4 + 5) + 5 \times 2 = ?$$

$$4. (4+3) \times 8 - (5+3) \times 6 = ?$$

$$5. (2+3) \times (7+4) - 27 = ?$$

## LESSON 43

## ORAL

1.  $4 + 6 - 8 \div 2 = ?$
2.  $(5 + 6) \times 8 = ?$
3. Reduce  $\frac{130}{12}$  to a mixed number.
4. At 10¢ a foot, what is the cost of 8 yd. of rope?
5. If 3 pk. of apples are sold from a barrel holding  $2\frac{1}{2}$  bu., how many pecks remain?
6. A merchant sold soap at 4¢ a cake and received 36¢ for it. How much would he have received had he sold it at 5¢ a cake?

## WRITTEN

1.  $742 + 14 \times 8 - (76 \div 4) = ?$
2.  $(8\frac{3}{4} + 5\frac{1}{2} - 2) + (6 + 1) + \frac{3}{4} \times 3 = ?$
3.  $842 - 9 \times 12 + 105 \div 5 = ?$
4.  $764 - (245 - 465 \div 5) = ?$
5.  $14 \times 7 + 789 - 540 \div 9 = ?$
6. Write in Arabic figures MCCCLXXXIII, DCXLIV, MCDLV.
7. Reduce to mixed numbers and add  $\frac{75}{4}$ ,  $\frac{99}{5}$ ,  $\frac{47}{7}$ .
8. At 8¢ a foot, how much will it cost to enclose an area 12 yd. long by 10 yd. wide?
9. A farmer dug 22 bu. of potatoes. He sold 3 pk. to one family, 1 bu. 2 pk. to another, and  $\frac{1}{2}$  bu. to a third. What fractional part of all did he sell?
10. A man sold land at \$38 an acre, receiving \$3648 for it. How much would he have received if he had sold it for \$56 an acre?

## LESSON 44

## ORAL

1.  $4 \times 7 + 15 \div 3 = ?$
2.  $3 \times (6 + 4) - (2 + 3) \times 4 = ?$
3. How many feet of wire are needed for a fence around a flower bed 3 yd. long and 2 yd. wide?
4. At \$1 a rod, what will be the cost of one mile of fence?
5. A field containing one acre is 20 rd. long. How wide is it?
6. When the divisor is  $\frac{1}{2}$  and the quotient is  $\frac{1}{4}$ , what is the dividend?

## WRITTEN

1. Simplify:  
 $(384 + 75 \times 9) + (26 \times 4 - 632 \div 8) + 593$ .
2.  $(75 \div 3 + 168) - 9 \times 8 + 467 \times 8 - (958 + 2 - 20)$ .
3.  $246 + 75 - 125 \div 5 + 267 \times 7 + (408 - 203)$ .
4. A rug is 4 yd. long and 8 ft. wide. Find the cost to bind it @ 3¢ a foot.
5. Multiply seven million eight hundred sixty-nine thousand ninety-seven by 5.
6. A square piece of tin is 2 ft. 4 in. on a side. How many square inches does it contain?
7. A fence was built along 3 mi. 50 rd. of a railroad track, on both sides. It cost \$1.09 a rod. Find the cost of the fence.
8. A field containing 180 A., 80 sq. rd., is 220 rd. long. How wide is it?
9. If the divisor is  $8\frac{3}{4}$  and the quotient is  $9\frac{3}{8}$ , what is the dividend?
10. What part of a mile is  $35\frac{5}{8}$  rd.?

## REVIEW XI

1. What will 4 rd. 10 ft. of fence cost @ 25¢ per foot?
2. Reduce 5 bu. 2 pk. to pecks.
3.  $14 - 8 \div 2 + 7 \times 9 = ?$
4. Find the cost of 12 bu. 3 pk. of vegetables @ 15¢ a peck.
5. At \$1.75 per day, how much will a man earn in  $6\frac{4}{5}$  da.?
6.  $(64 \div 8 + 21 \div 3) - (2 \times 6 + 12 \div 4) = ?$
7. A woman bought 12 yd. of silk @  $\$ \frac{7}{8}$  a yard, 10 yd. of lining @  $\$ \frac{1}{4}$  a yard, and other material for \$3.62. What change did she receive from a \$20 bill?
8. A railroad built a fence along one side of a track 2 mi. 640 ft. long, @ \$.25 per foot. How much did it cost?
9.  $(18 + 24) \times 5 - 136 \div 8 - 100 + 84 \div 28 = ?$
10. A man bought 210 ft. of lumber. He used  $\frac{2}{3}$  of it at one time, and  $\frac{1}{7}$  of it at another. How many feet had he left?

## FRACTION DRILL II

## SHORT METHOD

$$\frac{1}{3} + \frac{2}{5} = ?$$

$$(1 \times 5) + (2 \times 3)$$

$$\frac{\cancel{1} \times \cancel{2}}{\cancel{3} \times \cancel{5}} = \frac{11}{15}$$

$$(3 \times 5)$$

$$\frac{3}{4} + \frac{2}{3} = ?$$

$$(3 \times 3) + (4 \times 2)$$

$$\frac{\cancel{3} \times \cancel{2}}{\cancel{4} \times \cancel{3}} = \frac{17}{12} = 1\frac{5}{12}$$

$$(4 \times 3)$$

**RULE:** Multiply the numerator of each fraction by the denominator of the other fraction and add the two products for a new numerator. Multiply the denominators for a new denominator.

A

$$\frac{1}{2} + \frac{2}{3} = ?$$

$$\frac{1}{3} + \frac{6}{7} = ?$$

$$\frac{1}{5} + \frac{6}{7} = ?$$

$$\frac{1}{2} + \frac{3}{4} = ?$$

$$\frac{1}{3} + \frac{7}{8} = ?$$

$$\frac{1}{5} + \frac{7}{8} = ?$$

$$\frac{1}{3} + \frac{5}{8} = ?$$

$$\frac{1}{5} + \frac{7}{9} = ?$$

$$\frac{1}{2} + \frac{4}{5} = ?$$

$$\frac{1}{3} + \frac{3}{8} = ?$$

$$\frac{1}{5} + \frac{8}{9} = ?$$

$$\frac{1}{2} + \frac{3}{5} = ?$$

$$\frac{1}{3} + \frac{8}{9} = ?$$

$$\frac{1}{5} + \frac{9}{10} = ?$$

$$\frac{1}{2} + \frac{2}{5} = ?$$

$$\frac{1}{3} + \frac{7}{9} = ?$$

$$\frac{1}{6} + \frac{6}{7} = ?$$

B

$$\frac{1}{2} + \frac{5}{6} = ?$$

$$\frac{1}{3} + \frac{5}{9} = ?$$

$$\frac{1}{6} + \frac{7}{8} = ?$$

$$\frac{1}{2} + \frac{6}{7} = ?$$

$$\frac{1}{3} + \frac{9}{10} = ?$$

$$\frac{1}{6} + \frac{8}{9} = ?$$

$$\frac{1}{2} + \frac{5}{7} = ?$$

$$\frac{1}{4} + \frac{4}{5} = ?$$

$$\frac{1}{6} + \frac{9}{10} = ?$$

$$\frac{1}{2} + \frac{7}{8} = ?$$

$$\frac{1}{4} + \frac{3}{5} = ?$$

$$\frac{1}{7} + \frac{8}{9} = ?$$

$$\frac{1}{2} + \frac{5}{8} = ?$$

$$\frac{1}{4} + \frac{2}{5} = ?$$

$$\frac{1}{7} \times \frac{9}{10} = ?$$

$$\frac{1}{2} + \frac{3}{8} = ?$$

$$\frac{1}{4} + \frac{5}{6} = ?$$

C

$$\frac{1}{8} \times \frac{8}{9} = ?$$

$$\frac{1}{2} + \frac{7}{9} = ?$$

$$\frac{1}{4} + \frac{6}{7} = ?$$

$$\frac{1}{8} + \frac{9}{10} = ?$$

$$\frac{1}{2} + \frac{8}{9} = ?$$

$$\frac{1}{4} + \frac{7}{8} = ?$$

$$\frac{1}{9} + \frac{9}{10} = ?$$

$$\frac{1}{2} + \frac{9}{10} = ?$$

$$\frac{1}{4} + \frac{5}{8} = ?$$

$$\frac{1}{3} + \frac{3}{4} = ?$$

$$\frac{1}{4} + \frac{3}{8} = ?$$

$$\frac{1}{3} + \frac{4}{5} = ?$$

$$\frac{1}{4} + \frac{8}{9} = ?$$

$$\frac{1}{3} + \frac{3}{5} = ?$$

$$\frac{1}{4} + \frac{9}{10} = ?$$

$$\frac{1}{3} + \frac{2}{5} = ?$$

$$\frac{1}{5} + \frac{5}{6} = ?$$

FRACTION DRILL II—*Continued**D*

$$\frac{2}{3} + \frac{3}{4} = ?$$

$$\frac{5}{6} + \frac{6}{7} = ?$$

$$\frac{2}{3} + \frac{4}{5} = ?$$

$$\frac{5}{6} + \frac{7}{8} = ?$$

$$\frac{2}{3} + \frac{5}{6} = ?$$

$$\frac{5}{6} + \frac{8}{9} = ?$$

$$\frac{2}{3} + \frac{6}{7} = ?$$

$$\frac{5}{6} + \frac{9}{10} = ?$$

$$\frac{2}{3} + \frac{7}{8} = ?$$

*E*

$$\frac{6}{7} + \frac{7}{8} = ?$$

$$\frac{2}{3} + \frac{8}{9} = ?$$

$$\frac{6}{7} + \frac{8}{9} = ?$$

$$\frac{2}{3} + \frac{9}{10} = ?$$

$$\frac{6}{7} + \frac{9}{10} = ?$$

$$\frac{3}{4} + \frac{4}{5} = ?$$

$$\frac{7}{8} + \frac{8}{9} = ?$$

$$\frac{3}{4} + \frac{5}{6} = ?$$

$$\frac{7}{8} + \frac{9}{10} = ?$$

*F*

$$\frac{3}{4} + \frac{7}{8} = ?$$

$$\frac{3}{4} + \frac{8}{9} = ?$$

$$\frac{3}{4} + \frac{9}{10} = ?$$

$$\frac{4}{5} + \frac{5}{6} = ?$$

$$\frac{4}{5} + \frac{6}{7} = ?$$

$$\frac{4}{5} + \frac{7}{8} = ?$$

$$\frac{4}{5} + \frac{8}{9} = ?$$

$$\frac{4}{5} + \frac{9}{10} = ?$$

$$\frac{3}{4} + \frac{6}{7} = ?$$

## TYPE XIX

## BILL FORMS

*Teach the proper placing of the seller's name, and the buyer's name.*

On June 2, 1915, John Thompson bought of Henry Holden, 4 lb. butter @ \$.32; 5 lb. tea @ \$.60;  $3\frac{1}{2}$  lb. sugar for \$.18; and  $\frac{1}{2}$  lb. coffee @ \$.30.

Make out Mr. Thompson's bill

June 2, 1915

John Thompson,

To Henry Holden,

*Dr.*

4 lb. butter	@	.32	1	28
5 lb. tea	@	.60	3	00
$3\frac{1}{2}$ lb. sugar				18
$\frac{1}{2}$ lb. coffee	@	.30		15
			4	61

June 2, 1915.

John Thompson,

Bought of Henry Holden.

4 lb. butter	@	.32	1	28
5 lb. tea	@	.60	3	00
$3\frac{1}{2}$ lb. sugar				18
$\frac{1}{2}$ lb. coffee	@	.30		15
			4	61

## LESSON 45

## ORAL

1. What is the cost of 1 lb. 8 oz. of meat @ 24¢ per pound?
2. How many inches of string are there in a piece 3 ft. 4 in. long?
3. If 5 qt. of fruit will make 3 pt. of jelly, how many quarts are needed to make 12 pt. of jelly?
4. If a train travels 10 mi. in  $\frac{1}{2}$  hr., how far will it go in 12 min.?
5. How many hair ribbons 1 yd. long can be cut from 45 ft. of ribbon?
6. How many hours is it from 3 o'clock Friday afternoon to 3 o'clock Saturday afternoon?

## WRITTEN

1. Make out the bill for the following, bought by you from your grocer: 2 lb. coffee @ 35¢.;  $\frac{1}{4}$  lb. tea for 18¢; 3 lb. butter @ 30¢.
2. Make out the bill for the following: Morris Sickert sold Joseph Day 8 lb. nails @ 8¢ a pound; 5 lb. nails @ 6¢ a pound; 10 lb. wire @ 5¢ a pound.
3. In what two ways could you write the billhead for articles bought by Edward Adams from R. H. Macy & Co.?
4. John Howard bought 4 lb. 8 oz. of steak @ 22¢; 2 lb. 9 oz. of lamb chops @ 32¢, and 1 lb. 4 oz. of sausages @ 20¢, of Doepel Bros. Make out the bill in either form

LESSON 45—*Continued*

5. You are a dry-goods merchant and sell your teacher the following items: 12 yd. of silk @ \$2.50; 14 yd. lining @ 12¢; 6 spools of thread @ 5¢. Make out your bill.

6. To make a chair takes 4 pieces of wood, each 2 ft. 6 in. long, 4 pieces each 1 ft. 8 in. long, and 6 pieces 14 in. long. How many inches of wood are needed?

7. If 96 lb. of butter are made from 640 qt. of milk, how much milk is needed to produce 30 lb.?

8. If a train travels 260 mi. in 8 hr., how far will it travel in 6 hr. 30 min.?

9. A copper cornice is built around a building 44 ft. long by 38 ft. wide. Find the cost @  $\$3\frac{3}{5}$  per yard.

10. How many hours are there in 24 da. 12 hr.? How many minutes?

## LESSON 46

## ORAL

1.  $\frac{9}{10} \times \frac{5}{27} = ?$
2. Add  $\frac{2}{3}$  and  $\frac{5}{6}$ .
3. Multiply 16 by 100.
4. What will be received for selling 2 bu. of potatoes @ 20¢ per peck?
5. How many dozens are there in 80 pencils?
6. 8 sq. yd. is equal to how many square feet?

## WRITTEN

1. Make out the bill for the following items sold by John Wanamaker to Jas. Stark: 1 suit of clothes, \$18.75; 5 pairs socks @ 28¢; 3 shirts @ \$1.00.

2. In the following bill use a different form from the one you used above. You do some work for Mark Hoffman in 3 da. @ \$2.75 per day. You use 3 doz. screws @ 6¢ a dozen; 4 pairs of hinges @ \$.18 per pair; 30 ft. of lumber @ \$.06 a foot.

3. Mrs. May buys of Lord & Taylor 1 lamp and shade @ \$12.75; 1 bureau cover @ \$1.75, and 12 yd. of toweling @ \$.22. Make out the bill.

4.  $14\frac{2}{5} \times 5\frac{5}{7} \times \frac{3}{7}\frac{5}{2} = ?$  (Cancellation.)

5. Add  $18\frac{5}{9}$ ,  $3\frac{3}{7}$  and  $5\frac{1}{2}\frac{6}{1}$ .

6. Multiply 484 by 10 and that answer by 100. (Short process.)

7. Mr. Henry sells potatoes for 35¢ per peck which cost him \$1.20 a bushel. He sold 120 bu. How much did he gain?

8. Reduce  $1\frac{1}{2}\frac{9}{3}$  and  $4\frac{5}{9}\frac{7}{2}$  to mixed numbers.

9. What will 76 lemons cost at  $\$ \frac{3}{20}$  per dozen?

10. (a) Change 18 sq. yd. 8 sq. ft. to square feet.  
(b) To square inches.

## LESSON 47

## ORAL

1. Does the buyer or seller receipt the bill?
2. Find the sum of  $\frac{2}{3}$  and  $\frac{3}{4}$ .
3. How many rods in  $\frac{1}{8}$  mi.?
4. How much is left from 2 bu. when 1 bu. 3 pk. have been taken away?
5. Which is cheaper and how much per dozen, to buy oranges at 3¢ each or 30¢ per dozen?
6. A rug 12 ft. long contains 12 sq. yd. How many feet wide is it?

## WRITTEN

1. Make out the following bill:  
35 lb. starch @ 6¢; 85 lb. sugar @ 7¢;  $62\frac{1}{2}$  gal. vinegar @ 30¢. Billed to H. Smith by Jones Bros., grocers.
2. Make out the bill for 18 yd. carpet @  $62\frac{1}{2}$ ¢; 19 yd. lining @ 8¢; 2 pairs curtains @ \$5 per pair. Bought of Bloomingdale Bros. by you.
3. Make out the bill for 3 pairs shoes @ \$2.75; 1 pair slippers @ \$.75; and 2 pairs rubbers @ \$.60. Sold by Mace & Co. to Mrs. Mary Hylers.
4. Find the sum, difference, and product of  $\frac{4}{5}$  and  $\frac{5}{8}$ .
5. Reduce  $\frac{4}{15}$  mi. to rods.
6. A bin contains 45 bu. 2 pk. of corn. From this 8 bu. were taken out at one time and 20 pk. at another. How many pecks remained?

LESSON 47—*Continued*

7. If you buy oranges at \$2.00 a hundred and sell them at \$.30 a dozen, how much will you gain on 600 oranges?

8. Write and add 4,724,392; 8,507,400; ninety-two thousand two; MDCCCXIX.

9. A floor 26 ft. long contains  $36\frac{1}{9}$  sq. yd. How wide is it?

10. (a) Reduce 800 qt. 1 pt. to pints.

(b) Reduce 4 bu. 3 pk. to pecks.

## TYPE XX

## RECEIPTING OF BILLS

*Teach that the receipt must be signed by the seller. If signed by a clerk, the seller's name is signed and the clerk's initials are placed under the seller's name, thus:*

*Frank Joseph*

*Per M. R. S.*

*A receipt may also be written with the words "Received Payment" instead of paid.*

Philadelphia, Pa., May 20, 1915.

Mrs. George Chase,

*Bought of Frank Joseph.*

Terms

16 handkerchiefs	.12½	2	00		
5 yd. linen	.79	3	95		
13 yd. silk	.80	10	40		
				16	35
<i>Paid</i>					
Frank Joseph.					

1. Make out and receipt a bill supplying the names of buyer and seller for 12 white pads @ 4¢; 15 blank books @ 9¢; 15 blank books @ 4¢; 3 histories @ 65¢.

## LESSON 48

## ORAL

1. How many square yards in a wall 30 ft. long and 9 ft. high?
2. 11 qt. is what fractional part of a bushel?
3. A watering can holds 20 qt. How many gallons does it contain?
4.  $(\frac{1}{2} + \frac{1}{2}) \div \frac{1}{2} = ?$
5.  $4 \times 5 + 32 \div 8 = ?$
6.  $\frac{45 \times 36}{4 \times 5} = ?$

## WRITTEN

1. Write and receipt a bill for the following: 3 boxes of writing paper @ \$.35; 3 pkg. envelopes for \$.25; 1 bottle ink @ \$.20; 1 doz. pencils for \$.45.
2. Mr. Harkness receives a bill from Neale Bros. for 24 tons of coal @ \$6.75 a ton. He pays for it. Make out and receipt the bill.
3.  $436,759 + 87,095 + 135,862 + 9648 + 39,500 + 165 = ?$
4. What will it cost to cover a floor 10 ft. square with linoleum @ \$1.80 a square yard?
5. Find the number of bushels in 480 qt.
6. What is the cost of 268 qt. of molasses @ 50¢ a gallon?
7.  $(\frac{24}{5} \times \frac{5}{8}) + \frac{3}{4} = ?$
8. Divide 403,672 by 809.
9.  $(14 \times 8) - (126 - 30) + 19 = ?$
10.  $\frac{96 \times 52 \times 56 \times 120}{39 \times 112 \times 72 \times 150} = ?$

## REVIEW XII

1. Mr. Merkle, the grocer, sold to Mrs. Henry, 2 pk. of potatoes @ 25¢; 1 lb. of coffee @ 28¢; 3 boxes of crackers @ 5¢; 1 package of smoked beef @ 24¢. Make out and receipt the bill.

2. How many times must one walk around a square 200 ft. on a side in order to go 5 mi.?

3. Write and receipt the bill for 23 morning newspapers, 46¢; evening papers, 23¢; 4 Sunday papers @ 7¢; 1 package of paper, 60¢; bought of Henry Meyer by L. B. Guilick.

4. A pegging machine can peg a shoe in 4 min. How many shoes can it peg in 8 hr. 40 min.?

5. How many square yards are there in a grass plot 81 ft. by 56 ft.?

6. At 5¢ a quart, how much will I receive for 2 bu. 20 qt. of tomatoes?

7. I bought  $4\frac{1}{2}$  tons of coal @ \$5.60 per ton. How much change should I receive from \$30?

8. A hardware dealer purchased 10 doz. preserve jars for 36¢ per dozen and sold them at 4¢ apiece. What fractional part of the cost did he gain?

9.  $(2\frac{1}{2} \times 4 + 2) - (\frac{3}{7} \text{ of } 3\frac{1}{2} + 3 \times 2\frac{1}{2}) = ?$

10.  $3,876,921 \div 486 = ?$

## ADDITION DRILL III

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
66,318	63,425	82,367	48,329
48,692	37,562	47,093	72,585
64,598	50,903	81,366	17,195
87,264	36,592	63,705	64,937
37,926	73,229	49,587	58,378
65,287	65,962	36,642	37,405
82,574	48,537	28,367	23,867
75,321	62,311	13,409	14,521
<hr/>	<hr/>	<hr/>	<hr/>
47,363	37,246	90,827	64,325
92,898	89,374	57,286	30,059
28,364	45,677	73,994	76,425
45,736	58,643	28,545	27,864
37,289	40,908	69,736	82,478
82,564	72,356	58,757	69,823
78,432	28,454	42,365	30,470
64,957	46,078	74,298	92,879
<hr/>	<hr/>	<hr/>	<hr/>
27,363	40,388	79,367	55,267
64,077	82,632	27,939	49,083
83,653	76,387	80,483	80,639
39,728	49,836	15,037	37,942
70,896	63,088	63,765	63,289
64,945	27,850	58,230	56,947
30,372	94,267	37,948	83,064
87,796	37,692	14,590	47,938
<hr/>	<hr/>	<hr/>	<hr/>

ADDITION DRILL III—*Continued*

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
56,496	73,827	29,873	73,265
40,682	16,054	34,267	27,648
38,328	90,286	95,003	42,778
57,284	15,972	46,177	93,263
92,617	86,347	70,809	87,927
60,976	33,895	37,250	27,899
28,233	69,660	24,458	60,213
44,862	44,433	46,078	47,867
57,154	73,748	68,435	52,132
<u>56,411</u>	<u>23,132</u>	<u>31,280</u>	<u>98,642</u>

## REVIEW D

1. Find the cost to enclose a square field 200 ft. long at 24¢ a foot.

2. Add  $17\frac{1}{2}$ ,  $38\frac{3}{5}$ ,  $59\frac{7}{10}$ ,  $78\frac{5}{12}$ , and  $19\frac{1}{6}$ .

3. If Central Park is  $2\frac{1}{2}$  mi. long and  $\frac{1}{2}$  a mile wide, how many acres does it contain?

4. Find the cost, at 3¢ a foot, for picture frames for 18 pictures each 24 in. by 15 in.

5. It is 392 ft. around a square field. How long is the field?

6. A dealer sold 504 books:  $\frac{1}{8}$  of them @ \$1.25;  $\frac{1}{6}$  of them @ \$.75;  $\frac{1}{4}$  of them @ 50¢;  $\frac{1}{3}$  of them @ 25¢, and the remainder @ 10¢. What did he receive in all?

7. Add 89,175; 73,896; 548,796; 9387; 176,594; 897,865.

8.  $\frac{3}{4}$  of a yard is what part of 12 yd.?

9. From the sum of  $18\frac{7}{9}$  and  $34\frac{6}{7}$  take  $25\frac{2}{3}$ .

10.  $7 \times 6 + 5 \times 9 - \frac{2}{3}$  of  $63 + 7 \times 9 - 8 \times 7 = ?$

11. Multiply DXLVII by XCIV.

12. If the divisor is  $27\frac{1}{2}$  and the quotient is  $13\frac{4}{5}$ , what is the dividend?

13. A grocer bought 96 bu. of potatoes at 85¢ a bushel. He sold them at 30¢ a peck. Find his gain.

14. How many rods are there in  $\frac{5}{8}$  of a mile?

15.  $\frac{39 \times 56 \times 63 \times 64 \times 85}{34 \times 48 \times 81 \times 84 \times 91} = ?$

16. How much more fence will it take to enclose a lot 108 ft. by 48 ft. than one 72 ft. square?

REVIEW D—*Continued*

17. Find the difference in the areas of the two fields mentioned in question 16.

18. A dealer bought 38 tons of coal for \$171. He sold the lot, gaining \$1.50 on each ton. What part of the cost did he gain?

19. Find the prime factors of 5616.

20. The product of two numbers is 152,866. One of the factors is 854. What is the other?

21. Add: two million nine hundred thousand eight hundred ninety; seven million six hundred seventy thousand eight hundred twenty; sixty-eight thousand ninety-seven.

22. A farmer owned a piece of land 128 rd. long and 50 rd. wide. He sold 17 A. What part of his land did he sell?

23. Divide 970,968 by 14,072.

24. A merchant bought 576 yd. of cloth at  $87\frac{1}{2}\text{¢}$  a yard. He sold it, gaining \$216. At what price did he sell it per yard?

25. At 45¢ a pint, what is the cost of 3 qt. 1 pt. of alcohol?

26. A rug 9 ft. by 12 ft. will take up what part of a floor containing 20 sq. yd.?

27. The subtrahend is  $37\frac{3}{8}$ . The remainder is  $42\frac{8}{9}$ . Find the minuend.

28.  $27\frac{8}{9} \times 13\frac{1}{2} = ?$

29. From  $\frac{8}{9}$  of 756 take  $\frac{1}{16}$  of 784.

30. How many pieces of cardboard, each 4 in. square, can be cut from a piece 36 in. by 32 in.?

REVIEW D—*Continued*

31. How many more feet are there in  $\frac{5}{8}$  of a mile than in  $\frac{6}{10}$  of a mile?

32. Find the cost of 28 yd. of cloth at  $6\frac{3}{4}$ ¢ a yard.

33. There were received yesterday in New York 5264 cases of eggs, each containing 30 doz. What was their value at 23¢ a dozen?

34. At  $18\frac{3}{4}$ ¢ a yard, what will  $\frac{4}{5}$  of a yard of cloth cost?

35. Subtract the product of  $\frac{1}{2}$  and  $\frac{2}{3}$  from the sum of  $\frac{5}{6}$  and  $\frac{3}{4}$ .

36. A grocer has 96 bags of flour, each weighing  $24\frac{1}{2}$  lb. To how many barrels (196 lb.) is that equal?

37. A baker bought 1680 bbl. of flour. In January he used  $\frac{1}{6}$  of it; in February,  $\frac{1}{5}$  of it; in March,  $\frac{1}{7}$  of it; in April,  $\frac{1}{8}$  of it; in May,  $\frac{2}{15}$  of it; and in June,  $\frac{3}{16}$  of it. How many barrels had he left?

38. From a barrel of sugar, a grocer put up 99 bags of  $3\frac{1}{2}$  lb. each and had  $2\frac{1}{4}$  lb. left. How many pounds did the barrel contain?

39. What will it cost to kalsomine a ceiling 21 ft. by 18 ft. at 29¢ a square yard?

40. A lot is 125 ft. long. It is  $\frac{1}{2}\frac{2}{5}$  as wide. What is its area?

41. A grocer bought 90 doz. eggs. He sold  $\frac{2}{5}$  of them at 28¢ a dozen,  $\frac{4}{9}$  of them at 30¢, and the remainder @ 25¢. How much did he receive for all?

42. 9 days is what part of the month of June?

43. 15 hours is what part of a day?

REVIEW D—*Continued*

44.  $6\frac{2}{3}$  mo. is what part of a year?

45. A man having \$75.60, spent \$47.25. What part had he left?

46. In a class there are 28 boys and 20 girls. What part of the class is girls?

47. I bought on May 9 these goods of Fred Smith & Co.: 8 lb. of sugar @  $6\frac{1}{4}\text{¢}$ ; 2 lb. 3 oz. of butter @  $32\text{¢}$ ; 2 doz. eggs @  $29\text{¢}$ ;  $\frac{1}{2}$  lb. of tea @  $58\text{¢}$ . Write the bill and receipt it.

48. Add \$1.15, \$2.67, \$6.08, \$19, \$235.75, \$.72, \$8.78.

49. It is 300 ft. around a square field. What is its area?

50. A stationer bought 12 doz. pencils for  $75\text{¢}$ . He sold them at  $2\text{¢}$  each. How much did he gain?

## FRACTION DRILL III

## ADDITION AND SUBTRACTION

*As far as possible work problems mentally and write answer only.*

A	B	C	D	E	F
$5\frac{1}{4}$	$8\frac{1}{2}$	$4\frac{1}{8}$	$5\frac{3}{8}$	$6\frac{5}{8}$	$8\frac{1}{2}$
$3\frac{1}{2}$	$6\frac{3}{4}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{7}{8}$	$4\frac{5}{8}$
$5\frac{1}{8}$	$6\frac{1}{4}$	$10\frac{3}{8}$	$7\frac{1}{2}$	$8\frac{3}{4}$	$9\frac{5}{8}$
$3\frac{7}{8}$	$4\frac{1}{2}$	$5\frac{5}{8}$	$5\frac{7}{8}$	$2\frac{7}{8}$	$6\frac{3}{4}$
$7\frac{3}{8}$	$5\frac{1}{2}$	$8\frac{3}{16}$	$5\frac{1}{6}$	$7\frac{1}{3}$	$8\frac{1}{9}$
$3\frac{3}{4}$	$1\frac{3}{4}$	$3\frac{1}{2}$	$3\frac{3}{8}$	$4\frac{5}{8}$	$6\frac{2}{3}$
$7\frac{1}{2}$	$8\frac{1}{8}$	$9\frac{3}{16}$	$4\frac{1}{8}$	$6\frac{1}{4}$	$8\frac{3}{8}$
$5\frac{9}{16}$	$6\frac{1}{6}$	$5\frac{3}{4}$	$1\frac{1}{4}$	$3\frac{3}{8}$	$6\frac{7}{8}$
$5\frac{1}{2}$	$6\frac{2}{3}$	$7\frac{1}{10}$	$3\frac{1}{2}$	$7\frac{1}{4}$	$9\frac{9}{16}$
$4\frac{7}{12}$	$1\frac{5}{6}$	$5\frac{4}{5}$	$2\frac{9}{10}$	$5\frac{2}{3}$	$4\frac{5}{8}$
$6\frac{1}{8}$	$7\frac{1}{12}$	$8\frac{1}{3}$	$9\frac{1}{4}$	$8\frac{1}{2}$	$7\frac{1}{3}$
$4\frac{1}{3}$	$5\frac{5}{6}$	$6\frac{2}{3}$	$7\frac{5}{6}$	$6\frac{2}{3}$	$5\frac{1}{2}$
$5\frac{1}{6}$	$6\frac{1}{5}$	$7\frac{2}{3}$	$8\frac{1}{3}$	$4\frac{1}{4}$	$9\frac{1}{5}$
$3\frac{1}{2}$	$4\frac{1}{3}$	$4\frac{3}{5}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$5\frac{4}{5}$
$6\frac{1}{7}$	$5\frac{1}{8}$	$7\frac{3}{8}$	$4\frac{1}{3}$	$6\frac{5}{9}$	$9\frac{11}{16}$
$3\frac{5}{6}$	$3\frac{3}{7}$	$4\frac{7}{12}$	$1\frac{7}{12}$	$3\frac{7}{10}$	$5\frac{7}{8}$

## LESSON 49

## ORAL

1. What is the amount of the bill for 1 pair of shoes at \$2.50, and 1 pair of gloves at \$1.40?
2. How many square yards in a rug 6 ft. square?
3. Find  $\frac{3}{11}$  of 17.
4. A yard of silk costs \$1 and a yard of linen costs  $\frac{1}{2}$  as much. Find the cost of 2 yd. of each.
5.  $18 \div 3 + 7 \times 6 = ?$
6. What are the prime factors of 27?

## WRITTEN

1. Mr. J. Jones, living at 342 East 148th St., bought of James & Co., 34th St. and Broadway, the following goods: 4 yd. silk at  $\$1\frac{1}{2}$  a yard,  $12\frac{1}{2}$  yd. of linen at  $\$2\frac{1}{2}$  a yard, and 14 yd. of muslin at 5¢ a yard. Make out and receipt the bill.
2. Mr. Simpson bought of Wanamaker, 190 Broadway, one coat at \$20, 1 suit at \$22.50 and 1 hat at \$3.50. Make out and receipt the bill.
3. Yesterday your mother bought of Adams, Flanagan & Co.,  $4\frac{1}{2}$  yd. of ribbon at 22¢ a yard,  $2\frac{1}{2}$  yd. of velvet at  $\$1\frac{1}{2}$  a yard and  $3\frac{3}{4}$  yd. of silk at  $\$1\frac{1}{4}$  a yard. Make and receipt the bill.
4. Find the area in square yards of a room 36 ft. by 22 ft.
5. A farmer raised 4260 bu. of oats. He sent  $\frac{7}{15}$  of it to market, and sold  $\frac{9}{20}$  to a neighbor. How many bushels had he left?

LESSON 49—*Continued*

6. A yard of velvet costs \$3.25. A yard of lace costs  $\frac{1}{5}$  as much. Find the cost of  $12\frac{1}{2}$  yd. of lace.

7. A man earns \$24 $\frac{1}{2}$  a week. He spends  $\frac{4}{7}$  of it. How much does he save in 16 wk.?

8.  $(56 \div 7) \times 12 + 97 - (5 \times 4 - 8 + 18 \div 2) = ?$

9. Add all the prime factors of 5280.

10. Add 13,003,652

4,190,465

5,917,346

753,666

8,089,933

## LESSON 50

## ORAL

1. Reduce  $\frac{48}{60}$  to lowest terms.
2. What is the cost of 1 gal. 1 qt. of oil at 12¢ a pint?
3.  $16 \times 2\frac{1}{2} = ?$
4. If 6 doz. oranges cost \$2.40, what is the cost per dozen?
5.  $\frac{28 \times 6 \times 15}{6 \times 5 \times 7} = ?$
6. How many minutes are there in  $1\frac{1}{2}$  hr.?

## WRITTEN

1. Find the L. C. M. of 36, 10, 8, 60, 45, 4.
2. Reduce  $\frac{2388}{4704}$  to lowest terms.
3. A freight train travels  $14\frac{2}{5}$  mi. an hour. How far will it go in  $10\frac{5}{8}$  hr.?
4. (a) Write in figures MDCCCXLVIII.  
(b) Write in Roman notation the date of the discovery of America.
5. What is the shortest way of multiplying 567 by 1000?
6. Find the cost of 4 gal. 3 qt. of lime-water at 5¢ a quart.
7. Mr. M. Hauk, living at 342 East 148th St., bought of Lamb & Co., 34th St. & Broadway, 14 yd. of silk at \$1.50 per yd.;  $12\frac{1}{2}$  yd. of velvet at  $\$2\frac{1}{2}$  a yard and 48 yd. of muslin at  $5\frac{1}{2}$ ¢ a yard. Make out and receipt the bill.
8. Eight pieces of silk, each containing 35 yd., cost \$350. How much will 58 yd. cost at the same price per yard?
9.  $\frac{96 \times 52 \times 56 \times 120}{39 \times 112 \times 72 \times 150} = ?$
10. How many minutes are there in 14 hr. 15 min.?

## LESSON 51

## ORAL

1. I paid 60¢ for a basket of peaches and 20¢ less for a basket of plums. What did both cost?
2. How many half inches are there in  $8\frac{1}{2}$  in.?
3. What will  $\frac{3}{8}$  yd. of ribbon cost at 40¢ a yard?
4. A merchant sells 4 cakes of soap for 18¢ and makes 2¢. What did it cost him per cake?
5. How many square rods are there in  $\frac{1}{4}$  A.?
6. How many feet of tape are needed to bind the edges of a rug 24 in. by 72 in.?

## WRITTEN

1. A lady paid \$85 for a cloak and  $\$27\frac{3}{4}$  less for a dress. How much did she pay for both?
2. How many half-inches are there in 8 ft.?
3. If land is priced at  $\$139\frac{1}{2}$  an acre, what will  $\frac{5}{8}$  of an acre cost?
4.  $11\frac{1}{5}$  qt. is what part of a bushel?
5. Add 3,429,762; 1,581,348; 729,261; 381,849; 4,267,576.
6. A farmyard is to be fenced. It is 3 rd. long and 5 rd. wide. The fence is 2 rails high. How many feet of rails are required?
7. A man sold 35 A. of land for \$3080. If his profit was \$700, what did the land cost him an acre?
8. From the sum of 3408 and 6129, subtract their difference and divide the remainder by 204.
9. Find the average cost per acre of the following: 26 A. at \$96; 22 A. at \$144; and 110 A. at \$125. (Answer to nearest cent.)
10. What will  $6\frac{4}{5}$  T. of coal cost @  $\$6\frac{2}{5}$  a ton?

## LESSON 52

## ORAL

1. How many square feet are there in a flagstone 4 ft. long and  $2\frac{1}{2}$  ft. wide?
2. If a boy spends 5¢ of an allowance of 25¢, what part of his money has he left?
3. Find the cost of 2 lb. 4 oz. of chops @ 24¢ a pound.
4. How many dozen boxes are there in a package that contains 240 boxes?
5. 3 in. is what part of one-half a yard?
6.  $\frac{1}{3}$  is what part of two?

## WRITTEN

1. Find the cost to sod a field 48 ft. by 90 ft., @ 15¢ a square foot.
2.  $(4\frac{2}{5} + 3\frac{1}{3}) \times \frac{3}{4} = ?$
3. From 48 bu. of corn  $9\frac{3}{4}$  bu. were sold. What fractional part was sold?
4. Reduce 43,200 in. to yards.
5. Reduce to whole or mixed numbers,  $\frac{418}{13}$ ,  $\frac{928}{80}$ ,  $\frac{438}{65}$ .
6. A man bought 3 lb. 9 oz. of steak at 32¢ a pound. He paid for it with a \$2 bill. How much change did he receive?
7. I purchased 250 geraniums at \$1.20 per dozen. Find the cost.
8. Write and receipt a bill for labor amounting to \$12.60, paid by Jas. Monroe to Edward Bopp.
9. A woman spent  $\frac{4}{5}$  for lace costing \$4 a yard. How much lace did she buy?
10. Write these numbers: (a) four million 4 hundred eight thousand fifty-seven; (b) DCCLXXIV.

## REVIEW XIII

1. Find the prime factors of 9360.
2. From the sum of  $844\frac{5}{9}$  and  $112\frac{3}{8}$  take  $275\frac{3}{4}$ .
3. Add 6,902,308; 497,062; 2,413,735; 5,697,275; 342,516.
4. A poultry dealer raised 240 fowl. He sold  $\frac{3}{8}$  of them, averaging 4 lb. each, at 16¢ a pound;  $\frac{2}{5}$  of them, averaging  $3\frac{1}{2}$  lb., at 14¢ a pound, and the remainder, averaging  $4\frac{1}{2}$  lb. each, at 15¢ a pound. What did he receive for all?
5.  $(6+8\times 3)-(25\div 5+2\times 6)=?$
6. What is the cost of 1000 pens at  $1\frac{1}{4}$ ¢ each?
7.  $\frac{12\times 25\times 49\times 63}{7\times 9\times 4\times 5}=?$
8. Find the cost of a farm 220 rd. by 180 rd. at \$150 an acre.
9. 8 boxes of soap, weighing  $24\frac{1}{2}$  lb. each, cost \$7.84. For how much must it be sold per pound in order to gain \$3.92?
10. Add  $\frac{3}{4}$  of 976,  $\frac{7}{8}$  of 432,  $\frac{5}{6}$  of 732, and  $\frac{4}{5}$  of 90.

## MULTIPLICATION DRILL

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
1. 639,874 ×6 <u>        </u>	74,185 ×39 <u>        </u>	6584 ×527 <u>        </u>	3486 ×427 <u>        </u>	9798 ×807 <u>        </u>	627 ×396 <u>        </u>
2. 392,764 ×5 <u>        </u>	41,852 ×28 <u>        </u>	7859 ×457 <u>        </u>	6597 ×326 <u>        </u>	4987 ×879 <u>        </u>	392 ×129 <u>        </u>
3. 185,296 ×4 <u>        </u>	18,529 ×64 <u>        </u>	8795 ×346 <u>        </u>	5487 ×547 <u>        </u>	7789 ×798 <u>        </u>	913 ×109 <u>        </u>
4. 529,637 ×9 <u>        </u>	85,296 ×75 <u>        </u>	9076 ×427 <u>        </u>	8956 ×634 <u>        </u>	1897 ×708 <u>        </u>	479 ×621 <u>        </u>
5. 637,418 ×7 <u>        </u>	29,637 ×39 <u>        </u>	8756 ×452 <u>        </u>	4897 ×674 <u>        </u>	507 ×392 <u>        </u>	257 ×209 <u>        </u>
6. 418,529 ×8 <u>        </u>	96,374 ×28 <u>        </u>	9858 ×256 <u>        </u>	4987 ×547 <u>        </u>	627 ×396 <u>        </u>	397 ×238 <u>        </u>
7. 852,963 ×3 <u>        </u>	63,741 ×64 <u>        </u>	8796 ×537 <u>        </u>	4986 ×273 <u>        </u>	397 ×238 <u>        </u>	3906 ×8007 <u>        </u>

MULTIPLICATION DRILL—*Continued*

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
8. 521,907	30,741	8795	4857	748	846
×6	×75	×754	×374	×293	×320
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
9. 850,217	56,978	4372	5986	526	374
×5	×49	×475	×546	×192	×195
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
10. 307,418	65,987	4386	2978	426	495
×4	×38	×327	×789	×384	×326
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
11. 418,529	85,796	7598	5897	493	1429
×9	×27	×437	×978	×205	×156
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
12. 529,637	97,586	3276	8987	621	527
×7	×65	×175	×709	×479	×438
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
13. 630,741	53,642	5497	3798	495	1897
×8	×89	×264	×987	×317	×208
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
14. 741,852	48,059	7698	6879	836	1635
×3	×78	×437	×897	×497	×249
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

## LESSON 53

## ORAL

1. How many 16ths is  $\frac{48}{64}$ ?
2. If a painter covers 2 sq. ft. in 1 min., how long will it take him to cover a space 8 ft. by 6 ft.?
3. What number added to 18 will make 45?
4.  $49 - 8 \times 4 = ?$
5. What will be received for  $\frac{3}{7}$  of 63 qt. of oil at 10¢ a quart?
6. What are the prime factors of 63?

## WRITTEN

1. Change  $\frac{36}{63}$  to 49ths.
2. A farmer used 1 ton of phosphate for every 3 A. How many tons are required for a field 18 rd. by 20 rd.?
3. Two men are 348 mi. apart. They travel toward each other: one at the rate of 16 mi. per day, and the other at the rate of 18 mi. per day. How far apart are they at the end of 8 da.?
4. If I have \$40 and spend  $\$15\frac{3}{4}$  one day, and  $\$18\frac{7}{10}$  the next, how much have I left?
5. What number added to 269,875 will make 1,274,354? Write the answer in words.
6. How many square inches are there in a sheet of paper 3 ft. 4 in. square?
7.  $278 - (10 \times 9) \div 5 - (60 - 54 + 120 \div 10) = ?$
8. A man bought 320 A. of land at \$7 an acre. He sold  $\frac{3}{8}$  of it at \$9 an acre, and the remainder at \$8 an acre. What was his profit?
9. Find the prime factors of 580.
10. Add 2,048,753; 6972; 794; 3,702,168; 404,937; 1,208,074; 43,958.

## LESSON 54

## ORAL

1.  $16\frac{1}{2} \times 2 = ?$
2. How many peck baskets can be filled from 48 qt. of apples?
3. What is the average attendance of a class for 5 days when the total attendance is 200?
4. If I have \$60 and spend  $\frac{2}{5}$  of it for a suit of clothes, what does the suit cost?
5. How many square feet are there on a blackboard 20 ft. long and 3 ft. wide?
6.  $\$ \frac{1}{5}$  is what fractional part of \$2?

## WRITTEN

1. What is the distance in feet around a field 19 rd. long and 100 yd. wide?
2. At \$.09 a quart, how much will 3 bu. 2 pk. of cherries cost?
3. What is the quotient of  $28 \times 56 \times 15$  divided by  $14 \times 5 \times 6$ ?
4. What is the average cost per pound of 3 lb. of tea at \$.45 a pound, and 2 lb. at \$.65 a pound?
5. Find the smallest number that is exactly divisible by 66, 99, 135, and 168.
6. Multiply  $84\frac{1}{2}$  by  $\frac{4}{13}$ .
7. A man who had \$85,750, lost  $\frac{2}{5}$  of it in speculation. How much did he have left?
8. A man bought 180 A. of land at \$90 an acre, and 27 A. at \$135 an acre. He sold it all at \$160 an acre. Find the sum received for it and the gain.
9. At 5¢ a square foot what is the cost of 85 pine boards each 16 ft. long and 1 ft. wide?
10. What fractional part of 44 is  $2\frac{3}{4}$ ?

## LESSON 55

## ORAL

1. How many 4-oz. packages will weigh 3 lb. ?
2. A farmer exchanged potatoes at \$2 a barrel for 6 bbl. of flour at \$8 a barrel. How many barrels of potatoes did he give in exchange ?
3. How many rods are there in  $\frac{1}{4}$  mi. ?
4. Change 2 gal. to pints.
5.  $\frac{30 \times 40}{100} = ?$
6.  $345 \div 5 = ?$

## WRITTEN

1. I bought a chest of tea, weighing 56 lb., and sold it in 4-oz. packages at 15¢ a package. What did I receive for the tea ?
2. Add  $\frac{3}{4}$ ,  $5\frac{1}{8}$ ,  $2\frac{3}{8}$ , and  $\frac{11}{16}$ .
3. How many dozen eggs, at 22¢ a dozen, will pay for 5 bags of flour @ 88¢ each ?
4.  $\frac{16}{25}$  is what fractional part of 8 ?
5. The price of iron fence is \$1.20 a rod. Find the cost of  $\frac{3}{4}$  mi. of fence.
6. The dividend is 3,142,007; the divisor is 149. Find the quotient.
7. Write in Roman numbers the year of your birth, the present year, and your age.
8. Reduce 5 gal. 3 qt. to pints.
9. A roof is 45 ft. by 90 ft. How many gallons of paint are needed to cover it if 1 gal. covers 100 sq. ft. ?
10. There is a copper gutter all around the above roof. Find its cost at 22¢ a pound if the gutter weighs 2 lb. to the foot.

## LESSON 56

## ORAL

1. 100 gills is how many pints?
2.  $6 \times 2\frac{1}{2} = ?$
3. How long is the path around the park 200 ft. long and 50 ft. wide?
4.  $\frac{5}{9} \times \frac{3}{20} = ?$
5.  $30 - 7 \times 3 = ?$
6. How many pecks are there in 15 bu.?

## WRITTEN

1. Change 748 gi. to pints.
2. Find the cost of 56 gi. at  $5\frac{1}{2}\text{¢}$  a pint.
3. At  $12\frac{1}{2}\text{¢}$  a foot, what will 18 yd. of fence cost?
4. How many yards of fence will be needed to go around a field 84 ft. by 24 ft.?
5. What is the cost of 5 pk. of potatoes at  $68\text{¢}$  a bushel?
6. Change 17,964 sq. in. to square feet.
7. How many yards are there in  $2\frac{2}{5}$  mi.?
8.  $\frac{4 \times 12 \times 18}{15 \times 16 \times 27} = ?$
9.  $3\frac{1}{2} \times 4\frac{2}{3} \times \frac{4}{7} = ?$
10.  $(4\frac{1}{2} + \frac{1}{9}) \times 2 = ?$

## REVIEW XIV

1. How much longer is it around a field 40 rd. square than it is around a field 35 rd. by 37 rd.?

2. What is the difference in the area of the above two fields?

3. (a) Write in Arabic figures, XLVIII, XCIV, CLXI.

(b) Write in Roman letters, 56, 111, 246.

4. What is the value of 12 lb. 10 oz. of vaseline @  $1\frac{1}{2}\text{¢}$  per ounce?

5. In a class of 40 pupils, 22 received 95% for spelling, 10 received 90%, 6 received 80%, and the remainder 70%. What average did the class have?

$$6. \frac{24 \times 96 \times 144 \times 48}{64 \times 36 \times 32 \times 16} = ?$$

7. Divide three million forty-nine thousand six hundred fourteen by four hundred eighty-two. Prove.

$$8. 5\frac{7}{12} \times 3\frac{3}{7} + \frac{3}{4} \text{ of } \frac{2}{3} - 16 \div 8 = ?$$

9. I bought 24 doz. pads @ 4¢ each and sold them for \$14.40. How much was my gain?

10. Divide 29,150,706 by 359.

## DIVISION DRILL III

<i>A</i>	<i>B</i>	<i>C</i>
6) <u>3,839,247</u>	39) <u>2,893,259</u>	527) <u>3,469,979</u>
5) <u>1,963,821</u>	28) <u>1,171,875</u>	457) <u>3,591,590</u>
4) <u>741,185</u>	64) <u>4,079,469</u>	346) <u>3,043,092</u>
9) <u>4,766,739</u>	75) <u>2,305,641</u>	789) <u>2,349,753</u>
7) <u>4,461,927</u>	49) <u>2,791,929</u>	978) <u>5,767,349</u>
8) <u>3,348,233</u>	38) <u>2,507,511</u>	709) <u>6,371,989</u>
3) <u>2,558,891</u>	27) <u>2,316,504</u>	987) <u>3,748,657</u>
6) <u>3,131,445</u>	65) <u>6,343,118</u>	897) <u>6,170,469</u>
5) <u>4,251,086</u>	89) <u>4,774,160</u>	807) <u>7,906,998</u>
4) <u>1,229,673</u>	78) <u>3,748,633</u>	879) <u>4,383,774</u>
9) <u>3,766,767</u>	67) <u>2,343,279</u>	798) <u>6,215,624</u>
7) <u>3,707,460</u>	59) <u>2,875,037</u>	708) <u>1,343,149</u>
8) <u>5,045,929</u>	46) <u>2,350,474</u>	238) <u>94,495</u>
3) <u>2,225,558</u>	73) <u>1,816,202</u>	192) <u>100,993</u>

## LESSON 57

## ORAL

1. Reduce  $\frac{67}{9}$  to a mixed number.
2.  $2\frac{1}{2}$  is what fractional part of 5?
3. If a train travels a mile in 2 min., how far will it travel in one hour?
4.  $3\frac{2}{9} + 4\frac{7}{9} - 6 = ?$
5.  $42 \div 6 + 7 \times 8 = ?$
6. Write CMIX in Arabic figures.

## WRITTEN

1. Change to mixed numbers and add:  $\frac{819}{49}$ ,  $\frac{59}{7}$ ,  $\frac{73}{14}$ .
2. From the sum of  $\frac{7}{9}$ ,  $\frac{11}{12}$ ,  $\frac{2}{3}$ , and  $\frac{11}{18}$ , take  $\frac{4}{9} + \frac{5}{6} + \frac{3}{4}$ .
3.  $6\frac{3}{4} \times 84\frac{2}{9} = ?$
4. Divide 13 by 4 and take  $2\frac{2}{3}$  from the quotient.
5. What fractional part of 11 is  $4\frac{2}{5}$ ?
6.  $140 + 1\frac{5}{6} - (8\frac{7}{12} - 1\frac{1}{6}) = ?$
7.  $6\frac{7}{8} + 2\frac{1}{2} \times \frac{5}{6} = ?$
8. A factory turns out 3 completed articles each minute. How many articles can it produce in 8 hr. at the same rate?
9. The month of June has 30 da. How many minutes are there in June?
10. Add 408,762; 1,109,111; thirty-seven thousand seven; one million eighteen thousand five; and CMXCIX.

## LESSON 58

## ORAL

1. 40 gal. is equal to how many quarts?
2. How many pecks are there in 4 bu. 3 pk.?
3. What will be the cost of one pound of ginger if 2 oz. cost 5¢?
4. How many dozen eggs are there in 132 eggs?
5. At 6¢ for half a pound, what will 2 lb. of prunes cost?
6. What is the number of square inches in a paper 12 in. long, and half as wide as it is long?

## WRITTEN

1. How much will 2 bbl. of 30 gal. each of olive oil cost at 30¢ a quart?
2. Find the value of 108 qt. of lubricating oil at 75¢ a gallon.
3. What is the value of 2 bu. 3 pk. of potatoes @ 30¢ a peck?
4. Find the cost of 5 bu. 2 pk. of onions at 7¢ a quart.
5. Pearl buttons are priced at 40¢ a dozen. What will 184 buttons cost?
6. The postage on printed matter is 2¢ an ounce. What is the postage on a book which weighs 2 lb. 3 oz.?
7. A bushel of wheat weighs 60 lb. A carload weighs 40 tons. Counting 2000 lb. to the ton, how many bushels of wheat are there in one carload?
8.  $\frac{1}{2}$  a yard of cloth costs 40¢. How much must I pay for  $3\frac{3}{4}$  yd.?
9. What prime numbers multiplied together give 900?
10. What is the area of a piece of ground 129 yd. long and  $\frac{1}{3}$  as wide?

## LESSON 59

## ORAL

1. If a boy spends  $\frac{1}{2}$  and  $\frac{1}{4}$  of his money, what part has he left?
2. If tea costs 60¢ a pound and coffee costs  $\frac{1}{2}$  as much what will one pound of each cost?
3. Find the cost of 160 sq. rd. of land at \$40 per acre?
4. Change 108 sq. ft. to square yards.
5.  $(20 + 15) \times 2 = ?$
6.  $6 \times 3\frac{2}{3} = ?$

## WRITTEN

1. A teacher divides 1200 foreign stamps among three boys. The first receives  $\frac{1}{4}$ , the second  $\frac{2}{5}$ , and the third gets the remainder. How many did each receive?
2. A horse cost \$175.50 and a wagon  $\frac{2}{3}$  as much. Find the cost of both?
3. To cover a floor 12 strips of carpet are needed. Each strip is  $4\frac{2}{3}$  yd. long. How many yards are needed?
4. Mrs. Smith of Garden City bought of Lowney & Co.,  $4\frac{1}{2}$  lb. of chocolates at 60¢ a pound; 3 boxes of mixed candy at \$1.50 per box; and  $2\frac{1}{2}$  lb. of bonbons at 50¢ a pound. Make out the bill and receipt it.
5. Find the cost of a farm 110 rd. long by 60 rd. wide at \$60 an acre.
6. A lawn measures 84 ft. by 63 ft. It costs \$.85 a square yard to sod it. Find the total cost.
7. A tennis court measures 80 ft. by 45 ft. How many square yards does it contain?
8. Find the cost of the wire fencing around a tennis court 85 ft. square at  $20\frac{1}{4}$ ¢ a yard.
9. Multiply 80,652 by 138 and divide the product by 46.
10.  $(1240 - 465) \times 9 + 187 - (86 + 14) \div 10 = ?$

## LESSON 60

## ORAL

1. What is the cost of 3 oranges at 36¢ a dozen?
2. How many ounces are there in 5 lb.?
3.  $\frac{16 \times 64}{8 \times 8} = ?$
4. How long a strip of cloth 24 in. wide will cover 6 sq. ft.?
5. 80 sq. rd. is what part of one acre?
6. Divide 480 by 12.

## WRITTEN

1. Reduce 196 in. to feet.
2. Change 37 pk. to quarts.
3. How many ounces are there in 86 lb.?
4. Reduce 742 ft. to yards.
5. How many dozen are there in 168 things?
6. (a) Write four hundred thirty-six thousand seven hundred five.  
(b) Write ninety thousand seventeen.
7. A piece of electric cable 28 ft. 9 in. long was cut from a roll containing 20 yd. What fractional part of the roll was left?
8.  $\frac{96 \times 52 \times 56 \times 120}{39 \times 112 \times 72 \times 150} = ?$
9.  $\frac{60 \times 140 \times 132}{112 \times 150 \times 144} = ?$
10. If a field contains 3 A. and is 80 rd. long, find the distance around it.

## REVIEW XV

1. From a box containing 12 lb. of candy,  $4\frac{3}{4}$  lb. were sold. What part was sold?

2. From 12 boxes of crackers weighing  $16\frac{3}{4}$  lb. each, there were sold  $45\frac{1}{2}$  lb. How many pounds remained?

3.  $4\frac{2}{3} \times \frac{3}{8} \times 5\frac{5}{8}$  equals what part of 200?

4. Reduce 22,320 sq. in. to square yards.

5. How many feet of picture moulding are needed to make 8 frames, each 24 in. by 36 in.?

6. Find the cost of French glass for the above frames at 20¢ a square foot.

7. Divide 3,042,312 by 364.

8. A train traveled 3520 ft. in one minute. How long will it take it to go 90 mi.?

9.  $364 \div 28 \times (7\frac{2}{5} - 1\frac{7}{10}) - \frac{2}{3}$  of 81 = ?

10. A farmer sold 12 bu. 22 qt. of beans @ 7¢ a quart, and 96 gal. 3 qt. of milk @ 8¢ a quart. From which did he receive the greater amount, and how much greater?

## FRACTION DRILL IV

A

$$\frac{4}{5} \times \frac{7}{8} = ?$$

$$\frac{2}{3} \times \frac{3}{4} \times \frac{5}{6} = ?$$

$$4\frac{1}{2} \times 5\frac{1}{9} = ?$$

$$8\frac{2}{3} \times 4\frac{1}{2} = ?$$

$$\frac{7}{8} \times 6\frac{2}{5} = ?$$

$$2\frac{1}{2} \times 3\frac{1}{3} \times 1\frac{1}{5} = ?$$

$$3\frac{4}{5} \times 2\frac{1}{7} \times 6\frac{1}{2} = ?$$

$$3\frac{4}{5} \times \frac{2}{3} \times 8\frac{1}{2} = ?$$

$$4\frac{1}{2} \times 2\frac{1}{5} \times 1\frac{1}{7} = ?$$

$$1\frac{2}{3} \times \frac{5}{8} = ?$$

$$\frac{7}{8} \times \frac{9}{10} \times \frac{5}{14} = ?$$

$$2\frac{2}{3} \times 3\frac{1}{16} = ?$$

$$1\frac{6}{5} \times \frac{5}{8} = ?$$

$$\frac{4}{9} \times \frac{6}{27} \times \frac{3}{20} = ?$$

$$1\frac{5}{6} \times 3\frac{4}{11} = ?$$

$$3\frac{3}{4} \times 6\frac{1}{2} = ?$$

$$14\frac{2}{3} \times \frac{9}{11} = ?$$

$$\frac{1}{11} \times \frac{7}{20} = ?$$

$$\frac{7}{11} \times \frac{5}{14} \times \frac{3}{40} = ?$$

$$2\frac{1}{2} \times 6\frac{3}{10} = ?$$

$$5\frac{3}{5} \times 2\frac{7}{8} = ?$$

$$1\frac{6}{7} \times 11\frac{1}{3} = ?$$

$$7\frac{3}{5} \times 2\frac{2}{19} = ?$$

$$4\frac{5}{8} \times \frac{4}{5} = ?$$

B

$$\frac{\frac{4}{5}}{6} = ?$$

$$1\frac{1}{2} = ?$$

$$4\frac{1}{2} = ?$$

$$2\frac{4}{5} = ?$$

$$\frac{\frac{2}{3}}{8} = ?$$

$$3\frac{1}{3} = ?$$

$$8\frac{1}{3} = ?$$

$$1\frac{1}{7} = ?$$

$$\frac{\frac{5}{7}}{10} = ?$$

$$2\frac{1}{2} = ?$$

C

$$\frac{6\frac{2}{3}}{20} = ?$$

$$\frac{4\frac{1}{5}}{28} = ?$$

$$\frac{\frac{8}{9}}{24} = ?$$

$$\frac{4\frac{1}{5}}{21} = ?$$

$$\frac{1\frac{1}{4}}{10} = ?$$

$$5\frac{1}{3} = ?$$

$$\frac{\frac{7}{16}}{14} = ?$$

$$12\frac{1}{2} = ?$$

$$\frac{9\frac{1}{3}}{14} = ?$$

$$\frac{8\frac{1}{3}}{25} = ?$$

## REVIEW E

1. Find the cost to cover a floor 24 ft. by 21 ft. at \$1.50 a square yard?

2. A fishing boat brought in 2 tons of fish.  $\frac{5}{8}$  of this was put in cold storage,  $\frac{3}{10}$  was sent to the market, and the remainder was canned. How many pounds were canned?

3. What great historical event occurred in MCDXCII?

4. In an army there were 10 corps, each containing 10 divisions. Each division consisted of 10 regiments, and in each regiment were 1200 men. How many men were in the whole army?

5. When a water main broke, the water ran away at the rate of 1000 gal. a minute. The water was not shut off for 1 hr. 40 min. How many gallons were wasted?

6. How many ribbons, each  $\frac{1}{4}$  of a yard long, can be made from a piece  $15\frac{3}{4}$  yd. long?

7. Add 658,974; 389,795; 69,789; 432,978; 195,872; 69,387; 4958; and 659,599.

8. A lot 8 rd. long and 6 rd. wide is to be fenced. The fence is to be 3 rails high. How many feet of rails will it take?

9. Two gangs of men, one at each end, start to build a tunnel  $1\frac{1}{2}$  mi. long. If each gang can dig an average of 10 ft. a day, how many days will it take to complete the work?

10. How many square inches are there in a piece of paper 5 ft. long and 18 in. wide?

REVIEW E—*Continued*

11. What fractional part of 45 is  $2\frac{1}{4}$ ?

12. How many dozen eggs, at 18¢ a dozen, are equal in value to 48 yd. of cloth at  $6\frac{1}{4}$ ¢ a yard?

13.  $\frac{36 \times 52 \times 60 \times 70}{49 \times 54 \times 65 \times 72} = ?$

14.  $2\frac{2}{3} \times 3\frac{3}{4} \times 17\frac{1}{2} = ?$

15. Multiply  $13\frac{3}{4}$  by 5 and multiply the product by 8.

16. A piece of land 135 ft. long is  $\frac{1}{3}$  as wide. What is its area?

17. A. has \$4.50. B. has  $\frac{3}{5}$  as much. C. has twice as much as both. How much have all?

18. Multiply 2342 by 378 and divide the product by 756.

19. A field 65 rd. long contains  $19\frac{1}{2}$  A. How wide is it?

20. A man earns \$16.80 a week. He spends  $\frac{7}{8}$  of it. How much does he spend in 14 wk.?

21.  $12 \times 11 + 18 - (8 \times 9 + 3) - (3 \times 8 + 1) + 7 \times 9 + 2 = ?$

22. A yard of silk costs \$2.25 and a yard of lace  $\frac{2}{5}$  as much. Find the cost of 4 yd. of silk and  $2\frac{1}{2}$  yd. of lace.

23. Add the prime factors of 3960.

24. At the rate of  $42\frac{1}{2}$  mi. an hour, how far can a train run in  $4\frac{4}{5}$  hr.?

25. A grocer bought 59 gal. 3 qt. of molasses for \$25. He sold it at 18¢ a quart. How much did he gain?

26. 3 ft. is what part of 4 rd.?

27. A man sold a house and lot for \$6750, gaining \$575. If the land cost \$1800, what was the cost of the house?

28. A piece of land 256 ft. long requires 642 ft. of fence to enclose it. How wide is the land?

REVIEW E—*Continued*

29. A dealer paid \$399 for 19 doz. hats, which he sold, gaining \$136.80. At what price did he sell the hats per dozen?

30. Find the product of the sum and difference of 489 and 395.

31.  $4\frac{1}{2}$  bu. of potatoes were sold at 8¢ a quart. What was received for them?

32. A man bought a piece of land 20 rd. long and 16 rd. wide for \$200 an acre. What did it cost?

33. How many feet are there around the above lot?

34. He sold the same at  $2\frac{1}{2}$ ¢ a square foot. How much did he gain?

35. A dealer paid \$40 for a chest of tea containing 72 lb. He put it up in 4-oz. packages, which he sold at 25¢ a package. How much did he gain?

36.  $47\frac{5}{8} + 58\frac{7}{9} + 65\frac{7}{12} = ?$

37. A piece of paper 18 in. wide contains 9 sq. ft. How long is it?

38. A farmer who owned 45 A. of land, sold a part of it 32 rd. by 25 rd. What part of his land did he sell?

39. Add nine hundred sixty thousand seventy-eight; three hundred nine thousand six hundred nine; eighty-eight thousand four.

40. From the sum of  $\frac{8}{9}$  of 108 and  $\frac{3}{5}$  of 105 take  $\frac{3}{4}$  of 112.

41. 21 days is what part of a month?

42. Subtract  $\frac{1}{2}$  of  $37\frac{1}{2}$  from the sum of  $28\frac{6}{7}$  and  $19\frac{2}{3}$ .

43. A merchant sold for 50¢ each, ties which cost him \$4.50 a dozen. What part of the cost did he gain?

REVIEW E—*Continued*

44. In a school there are 479 dictionaries, which cost 58¢ each. What was the cost of all?

45. Add: nine dollars eight cents; ten dollars fifteen cents; three hundred dollars; eight and one-half dollars; seventy-nine cents; twenty-five dollars three cents.

46. From the sum of \$18.43, \$16.75, \$9.87, and \$13.81 take \$49.95.

47. An agent's sales of books for a week were as follows: 140, 375, 504, 768, 550, and 99. What were his average daily sales?

48. How many square feet are there on a floor  $19\frac{1}{2}$  ft. long and  $18\frac{3}{4}$  ft. wide?

49. A post-office clerk can stamp 200 letters a minute. How many can he stamp between 11 min. of 11 o'clock and 9 min. after 11 o'clock?

50. How many square yards of bunting are needed to make 15 flags each 6 ft. by 9 ft. and 36 flags each 9 ft. by  $14\frac{1}{2}$  ft.?

## TABLES

## LONG MEASURE

12 in. = 1 ft.	320 rd. = 1 mi.
3 ft. = 1 yd.	5280 ft. = 1 mi.
$16\frac{1}{2}$ ft. = 1 rd.	

## DRY MEASURE

2 pints = 1 qt.	4 pecks = 1 bu.
8 quarts = 1 pk.	

## LIQUID MEASURE

4 gi. = 1 pt.	4 qt. = 1 gal.
2 pt. = 1 qt.	

## TIME

60 sec. = 1 min.	365 da. = 1 yr.
60 min. = 1 hr.	366 da. = 1 leap yr.
24 hr. = 1 da.	100 yr. = 1 cen.
7 da. = 1 wk.	

## AVOIRDUPOIS WEIGHT

16 oz. = 1 lb.	20 cwt. = 1 T.
100 lb. = 1 cwt.	2000 lb. = 1 T.

## SQUARE MEASURE

144 sq. in. = 1 sq. ft.	160 sq. rd. = 1 A.
9 sq. ft. = 1 sq. yd.	640 A. = 1 sq. mi.
$30\frac{1}{4}$ sq. yd. = 1 sq. rd.	
C = 100	144 things = 1 gr.
M = 1000	12 doz. = 1 gr.
12 things = 1 doz.	

## TYPES FROM FOURTH YEAR—SECOND HALF

## TYPE I

## LONG DIVISION BY NUMBERS OF THREE FIGURES

1. Divide 82,208 by 112.

$$\begin{array}{r}
 734 \\
 112 \overline{)82,208} \\
 \underline{784} \phantom{00} \\
 380 \phantom{00} \\
 \underline{336} \phantom{00} \\
 448 \phantom{00} \\
 \underline{448} \\
 0
 \end{array}$$

2. Divide 71,000 by 125.

$$\begin{array}{r}
 568 \\
 125 \overline{)71,000} \\
 \underline{625} \phantom{00} \\
 850 \phantom{00} \\
 \underline{750} \phantom{00} \\
 1000 \phantom{00} \\
 \underline{1000} \\
 0
 \end{array}$$

3. Divide 61,614 by 189.

4.  $83,592 \div 258 = ?$

5.  $167,352 \div 367 = ?$

6.  $130,298 \div 574 = ?$

7.  $356,907 \div 439 = ?$

8.  $117,390 \div 602 = ?$

9.  $358,978 \div 751 = ?$

10.  $438,249 \div 861 = ?$

11.  $573,344 \div 943 = ?$

## TYPE II

## MULTIPLICATION BY 3 ORDERS WITH 0 IN TENS' PLACE

1.  $384$

$\times 207$

---

$2688$

$768$

---

$79,488$

(a) Multiply by the first figure of the multiplier, 7.

(b) Since the product of a number and 0 is 0, we omit the multiplication by 0 and proceed to the next figure of the multiplier, 2. Write the first figure of the product under the figure 2 of the multiplier.

2. Multiply 517 by 305.

3.  $1172 \times 509 = ?$

4.  $682 \times 704 = ?$

5.  $229 \times 105 = ?$

6.  $354 \times 203 = ?$

7.  $192 \times 607 = ?$

8.  $2175 \times 702 = ?$

9.  $1324 \times 309 = ?$

10.  $976 \times 104 = ?$

## TYPE III

ADDITION OF FRACTIONS HAVING THE SAME  
DENOMINATOR*Teach that in a fraction:*A. The number above the line is called the **numerator**.B. The number below the line is called the **denominator**.

1.  $\frac{1}{9}$  (a) 1 apple + 5 apples + 2 apples = 8 apples.

$\frac{5}{9}$  (b) 1 ninth + 5 ninths + 2 ninths = 8 ninths.

$$\frac{2}{9}$$

---

$$\frac{8}{9}$$

RULE: Add the numerators and write the  
sum over the denominator.

2. Add  $\frac{1}{8}$   
 $\frac{3}{8}$   

---

 $\frac{2}{8}$

3. Add  $\frac{1}{4}$   
 $\frac{1}{4}$   

---

 $\frac{1}{4}$

4. Add  $\frac{3}{11}$   
 $\frac{4}{11}$   
 $\frac{1}{11}$   

---

 $\frac{2}{11}$

5. Add  $\frac{5}{17}$   
 $\frac{3}{17}$   
 $\frac{6}{17}$   

---

## ADDITION OF MIXED NUMBERS

A whole number and a fraction written together is called  
a *mixed number*.

1. Add  $3\frac{2}{7}$

$1\frac{1}{7}$

$5\frac{3}{7}$

$9\frac{6}{7}$  Ans.

(a) Add the numerators and write  
the sum over the denominator.

(b) Add the whole numbers.

(c) Add the two answers.

2. Add  $4\frac{3}{19}$   
 $5\frac{7}{19}$   
 $6\frac{5}{19}$   

---

Add  $14\frac{2}{11}$   
 $2\frac{5}{11}$   
 $6\frac{1}{11}$   

---

4.  $110\frac{11}{27} + 58\frac{4}{27} + 90\frac{7}{27} = ?$

5. What is the sum of  $7\frac{8}{15}$ ,  $2\frac{4}{15}$ , and 15.

TYPE III—*Continued*SUBTRACTION OF FRACTIONS HAVING THE SAME  
DENOMINATOR

1. From
- $\frac{3}{4}$
- take
- $\frac{1}{4}$
- .

$$\begin{array}{r} \frac{3}{4} \\ -\frac{1}{4} \\ \hline \frac{2}{4} \end{array}$$

(a) 1 apple from 3 apples leaves 2 apples.

(b) 1 fourth from 3 fourths leaves 2 fourths.

RULE: *Subtract the numerators and write the difference over the denominator.*

2. From
- $\frac{8}{9}$
- take
- $\frac{3}{9}$
- .

3. From
- $\frac{6}{7}$
- take
- $\frac{3}{7}$
- .

4. From
- $\frac{7}{13}$
- take
- $\frac{3}{13}$
- .

5. From
- $\frac{8}{15}$
- take
- $\frac{2}{15}$
- .

## SUBTRACTION OF MIXED NUMBERS

1. From
- $12\frac{5}{8}$
- take
- $9\frac{3}{8}$
- .

$$\begin{array}{r} 12\frac{5}{8} \\ -9\frac{3}{8} \\ \hline 3\frac{2}{8} \end{array}$$

(a) Subtract the fractions.

(b) Subtract the whole numbers.

(c) Add the whole number and fraction together.

2. From
- $8\frac{5}{7}$
- take
- $3\frac{2}{7}$

- 3.
- $9\frac{7}{9}$
- minus
- $8\frac{5}{9} = ?$

4. A boy had
- $\$8\frac{3}{4}$
- and spent
- $\$5\frac{1}{4}$
- . How much had he left?

5. What is the difference between
- $16\frac{7}{12}$
- and
- $11\frac{5}{12}$
- ?

- 6.
- $124\frac{11}{18} - 99\frac{7}{18} = ?$

## TYPE IV

## ADDITION OF FRACTIONS WHERE THE SUM OF THE FRACTIONS AMOUNTS TO A UNIT

1. Add
- $2\frac{1}{2}$
- ,
- $3\frac{1}{2}$
- and 5.

$$\begin{array}{r|l}
 2 & \frac{1}{2} \\
 3 & \frac{1}{2} \\
 5 & \\
 \hline
 10 & \frac{2}{2} = 1 \\
 +1 & \\
 \hline
 11 & \text{Ans.}
 \end{array}$$

$$\frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1.$$

Add 1, the sum of the fractions, to  
10, the sum of the integers:  $10 + 1 = 11$ .

2.  $4\frac{2}{3} + 3\frac{1}{3} = ?$

3. Find the sum of  $8\frac{1}{7}$ ,  $2\frac{3}{7}$ , and  $4\frac{3}{7}$ .

4. What is the sum of  $7\frac{2}{9}$ ,  $3\frac{5}{9}$ , and  $\frac{2}{9}$ ?

5. A father divided a sum of money among his three children. He gave  $\$5\frac{2}{3}$  to one,  $\$7\frac{2}{3}$  to another, and  $\$8\frac{1}{3}$  to the third. How much money did they all receive?

6.  $3\frac{5}{8} + 4\frac{2}{8} + 7\frac{1}{8} = ?$

7. Find the sum of  $6\frac{3}{10}$ ,  $7\frac{1}{10}$ ,  $4\frac{1}{10}$ , and  $5\frac{5}{10}$ .

8.  $6\frac{5}{12} + 7\frac{1}{12} + 3\frac{1}{12} + 8\frac{5}{12} = ?$

9.  $3\frac{7}{4} + 8\frac{1}{4} + 2\frac{1}{4} + 4\frac{5}{4} = ?$

10. To the sum of  $5\frac{7}{15}$ ,  $6\frac{1}{15}$ ,  $1\frac{2}{15}$  and  $\frac{4}{15}$ , add  $3\frac{1}{15}$ .

## TYPE V

## REDUCTION OF FRACTIONS TO LOWER TERMS

*Teach that*

*A. The factors of a number are the **integers** whose product equals the number.*

*B. Any number which is a **factor** of two or more numbers is called a **common factor** of those numbers.*

1. Reduce  $\frac{24}{36}$  to lower terms.

(a) Find a common factor of 24 and 36.

(b) 12 is a common factor of 24 and 36.

(c) Divide both numerator and denominator by 12.

$$\begin{array}{l} 24 \div 12 = 2 \\ \hline 36 \div 12 = 3 \end{array} \quad \text{Ans.}$$

**RULE:** *To reduce a fraction to lower terms, divide both numerator and denominator by a common factor.*

2. Reduce  $\frac{8}{12}$  to lower terms.

3. Reduce  $\frac{9}{12}$  to lower terms.

4. Reduce  $\frac{16}{18}$  to lower terms.

5. Find a fraction which is equal to  $\frac{8}{24}$ .

6. Reduce  $\frac{27}{45}$  to lower terms.

7. Reduce  $\frac{48}{60}$  to lower terms.

## TYPE VI

## REDUCTION OF FRACTIONS TO HIGHER TERMS

A.  $1 = \frac{2}{2}, \frac{3}{3}, \frac{4}{4}, \frac{5}{5}, \frac{8}{8}, \frac{12}{12}$ , etc.

1.  $\frac{1}{2}$  is how many fourths?

Since  $1 = \frac{4}{4}$ ,  $\frac{1}{2} = \frac{1}{2}$  of 4 fourths  $= \frac{2}{4}$ .

Changing  $\frac{1}{2}$  to  $\frac{2}{4}$  is equivalent to multiplying both numerator and denominator by 2.

$$\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}.$$

2. Change  $\frac{1}{2}$  to 6ths, to 8ths, to 10ths, to 12ths.

3. Change  $\frac{1}{3}$  to 6ths, to 9ths, to 12ths, to 15ths.

4. Change  $\frac{1}{4}$  to 8ths, to 12ths, to 16ths, to 24ths.

PRINCIPLE: *Multiplying both numerator and denominator of a fraction by the same number does not change the value of the fraction.*

5. Change  $\frac{2}{3}$  to 6ths.

$$\frac{1}{3} = \frac{1}{3} \text{ of } 6 \text{ sixths} = \frac{2}{6}. \quad \frac{2}{3} = 2 \text{ times } \frac{1}{3} = 2 \text{ times } 2 \text{ sixths} = \frac{4}{6}.$$

6. Change  $\frac{3}{4}$  to 12ths.

$$\frac{1}{4} = \left(\frac{1}{4} \text{ of } \frac{12}{12}\right) = \frac{3}{12}. \quad \frac{3}{4} = (3 \text{ times } \frac{1}{4}) = 3 \text{ times } \frac{3}{12} = \frac{9}{12}.$$

7.  $\frac{3}{5} = \frac{?}{10}$ ;  $\frac{4}{5} = \frac{?}{10}$ ;  $\frac{5}{6} = \frac{?}{12}$ ;  $\frac{5}{8} = \frac{?}{16}$ .

8. How did you find the number of tenths in  $\frac{1}{5}$ ?

9. How did you find the number of 10ths in  $\frac{3}{5}$ ? in  $\frac{4}{5}$ ?

RULE: *Divide the denominator required by the denominator of the fraction, and multiply both terms of the fraction by the quotient.*

10. Change  $\frac{3}{8}$  to 16ths, to 24ths.

11. Change  $\frac{2}{3}$  to 9ths, to 15ths, to 18ths.

## TYPE VII

## REDUCTION OF IMPROPER FRACTIONS TO WHOLE OR MIXED NUMBERS

*A fraction whose numerator is smaller than its denominator is called a proper fraction.*

*A fraction whose numerator equals or is larger than its denominator is called an improper fraction.*

1.  $\frac{4}{2} = ?$

(a) 2 halves = one.

(b) 4 halves equals as many ones as there are 2's in 4.  $4 \div 2 = 2$ ; therefore  $\frac{4}{2} = 2$ .

2.  $\frac{8}{4} = ?$

(a) 4 quarters = one.

(b) 8 quarters equal as many ones as there are 4's in 8.  $8 \div 4 = 2$ ; therefore  $\frac{8}{4} = 2$ .

3.  $\frac{13}{4} = ?$

4. Reduce  $\frac{9}{2}$  to a mixed number.

5. Reduce to mixed numbers  $\frac{5}{3}$ ,  $\frac{7}{5}$ ,  $\frac{18}{4}$ ,  $\frac{21}{4}$ ,  $\frac{235}{15}$ ,  $\frac{490}{80}$ .

6. Reduce to whole or mixed numbers  $\frac{36}{9}$ ,  $\frac{111}{11}$ ,  $\frac{84}{7}$ .

## TYPE VIII

## ADDITION OF FRACTIONS AND MIXED NUMBERS WHEN THE SUM OF THE FRACTIONS IS MORE THAN A UNIT

1. Add  $\frac{3}{4}$  and  $\frac{2}{4}$ .

*Reduce the sum to a mixed number.*  $\frac{3}{4} + \frac{2}{4} = \frac{5}{4} = 1\frac{1}{4}$ .

2.  $\frac{3}{11} + \frac{5}{11} + \frac{7}{11} = ?$  3. Find the sum of  $3\frac{5}{9}$ ,  $2\frac{8}{9}$ , and  $5\frac{7}{9}$ .

4. John earned  $\$2\frac{3}{4}$  one day,  $\$3\frac{3}{4}$  another day, and  $\$1\frac{1}{4}$  a third day. How much did he earn in all?

## TYPE IX

*Teach that a number that will exactly contain another number is called a **multiple** of that number.*

*Teach that a number that is a multiple of two or more numbers is called a **common multiple** of those numbers.*

1. Find a number that will exactly contain 3 and 4.

The multiples of 3 are 3, 6, 9, 12, etc.

The multiples of 4 are 4, 8, 12, 16, etc.

By inspection we find that 12 is a multiple of both 3 and 4. Therefore 12 is a common multiple of 3 and 4.

2. Find a common multiple of 3 and 5.

3.   “           “           “           4 and 5.

4.   “           “           “           3 and 7.

5.   “           “           “           2, 3 and 5.

(a) The multiples of 5 are 5, 10, 15, 20, 25, 30, etc.

(b) Of these 15 and 30 are multiples of 3.

(c) Of these 30 is a multiple of 2.

Therefore 30 is a common multiple of 2, 3, and 5.

6. Find a multiple of 5 which is also a multiple of 3 and 4.

7. Find a common multiple of 3, 5, and 6.

Any multiple of 6 is also a multiple of 3; therefore we need to find only the common multiple of 5 and 6 in order to find a common multiple of 3, 5, and 6.

8. Find a common multiple of 2, 3, 5, and 9.

9. Find a common multiple of 2, 3, 4, 6, and 9.

10. Find a common multiple of 2, 3, 4, 6, and 8.

## TYPE X

## ADDITION AND SUBTRACTION OF FRACTIONS WITH DIFFERENT DENOMINATORS

1. Add  $\frac{1}{2}$ ,  $\frac{1}{3}$  and  $\frac{1}{4}$ .

$$\begin{array}{r|l} \frac{1}{2} & \frac{6}{12} \\ \frac{1}{3} & \frac{4}{12} \\ \frac{1}{4} & \frac{3}{12} \\ \hline 1\frac{1}{12} & \frac{13}{12} = 1\frac{1}{12} \end{array}$$

(a) Find a common multiple of the denominators 2, 3, and 4.

(b) 12 is a common multiple of 2, 3, and 4. 24 is a common multiple of 2, 3, and 4, but 12 is the smaller, therefore we use 12 because it is easier to reduce halves, thirds, and fourths to 12ths.

(c) Change each fraction to 12ths.

(d) Add the fractions.

2. Add  $2\frac{1}{3}$ ,  $1\frac{1}{6}$ , and  $3\frac{1}{5}$ .

$$\begin{array}{r|l} 2\frac{1}{3} & \frac{10}{30} \\ 1\frac{1}{6} & \frac{5}{30} \\ 3\frac{1}{5} & \frac{6}{30} \\ \hline 6\frac{7}{10} & \frac{21}{30} = \frac{7}{10} \end{array}$$

To add fractions having different denominators, we must change them to a common denominator and add the fractions obtained.

The smallest denominator to which all the fractions can be reduced is called the *least common denominator*.

3. Add  $4\frac{1}{5}$  and  $9\frac{1}{4}$ .

4.  $12\frac{1}{12} + 9\frac{1}{3} = ?$

5.  $\frac{1}{8} + \frac{1}{3} + \frac{1}{6} = ?$

6.  $9\frac{1}{4} + 5\frac{1}{5} + 7\frac{1}{10} = ?$

7.  $8\frac{1}{3} - 4\frac{1}{12} = ?$

8.  $12\frac{1}{3} - 9\frac{1}{8} = ?$

## TYPE XI

## ADDITION AND SUBTRACTION OF FRACTIONS HAVING DIFFERENT DENOMINATORS WITH NUMERATORS MORE THAN ONE

1. Add
- $1\frac{2}{3}$
- and
- $2\frac{3}{4}$
- .

1	$\frac{2}{3} = \frac{8}{12}$
2	$\frac{3}{4} = \frac{9}{12}$
3	$\frac{17}{12} = 1\frac{5}{12}$
$1\frac{5}{12}$	

$$4\frac{5}{12} \quad \text{Ans.}$$

- (a) Change  $\frac{2}{3}$  and  $\frac{3}{4}$  to a common denominator.  
 (b)  $\frac{2}{3} = \frac{8}{12}$ ;  $\frac{3}{4} = \frac{9}{12}$ .  
 (c) The sum of  $\frac{8}{12}$  and  $\frac{9}{12}$  is  $\frac{17}{12}$  or  $1\frac{5}{12}$ .  
 (d) Add  $1\frac{5}{12}$  to the sum, (3), of the whole numbers, making  $4\frac{5}{12}$ .

2. Add  $3\frac{3}{4}$  and  $4\frac{5}{6}$ .

3. Add  $12\frac{3}{5}$  and  $9\frac{5}{6}$ .

4. Find the sum of  $1\frac{2}{3}$  and  $5\frac{5}{7}$ .

5.  $14\frac{5}{7} - 9\frac{3}{4} = ?$

*To subtract fractions having different denominators,*

- (a) Change the fractions to a common denominator.  
 (b) Subtract the fractions.

6. From  $210\frac{2}{3}$  bu. of grain  $118\frac{3}{5}$  bu. were sold. How many bushels were left?

7. From  $25\frac{3}{5}$  take  $8\frac{3}{8}$ .

8.  $16\frac{3}{4} - 9\frac{1}{2} = ?$

## TYPE XII

## SUBTRACTION OF A MIXED NUMBER FROM A WHOLE NUMBER

$$\begin{array}{r|l}
 7 & 1 = \frac{2}{3} \\
 8 & - \frac{2}{3} \\
 \hline
 5\frac{1}{3} & \frac{1}{3}
 \end{array}$$

1. Take  $2\frac{2}{3}$  from 8.

(a) There is no fraction from which to take  $\frac{2}{3}$ , therefore take 1 from the whole number, 8, leaving 7. That 1 equals  $\frac{3}{3}$ .

(b) Subtracting the fraction  $\frac{2}{3}$  from the fraction  $\frac{3}{3}$  leaves  $\frac{1}{3}$ .

(c) Subtracting the whole number 2 from 7, leaves 5.

2.  $5 - 3\frac{3}{4} = ?$

3.  $12 - 9\frac{2}{7} = ?$

4.  $8 - 3\frac{7}{9} = ?$

5. Henry swam 48 ft., William  $36\frac{5}{6}$  ft. How many more feet did Henry swim than William?

6. Find the difference between 18 and  $12\frac{1}{3}$ .

7. A man had \$50. He spent  $\$34\frac{3}{4}$ . How much had he left?

8. A farmer raised 135 bu. of potatoes.  $19\frac{3}{8}$  bu. were bad. How many bushels were good?

9. A carpenter bought 105 ft. of moulding. He sold  $72\frac{2}{5}$  ft. How many feet were left?

10. A train had 100 mi. to go. After going  $50\frac{2}{7}$  mi., how many miles was it from the end of the trip?

## TYPE XIII

## REDUCTION OF A MIXED NUMBER TO AN IMPROPER FRACTION

1. How many half dollars are there in one dollar?

How many quarters in two dollars?

How many thirds in 1? in 2? in 5?

If you change \$3 in bills for  $\frac{1}{2}$  dollars, how many would you get? How many quarters are there in \$4?

2. How many eighths in 2? in 5?

Since there are 8 eighths in 1, in 2 there are 2 times 8 eighths, which is 16 eighths, or  $\frac{16}{8}$ .

3. How many 9ths in  $3\frac{1}{9}$ ?

In 1 there are 9 ninths; in 3 there are 3 times 9 ninths = 27 ninths.  $27 \text{ ninths} + 1 \text{ ninth} = 28 \text{ ninths}$ , or  $\frac{28}{9}$ .

4. Reduce  $7\frac{3}{4}$  to fourths.

(a) 7 times 4 fourths = 28 fourths.

(b)  $28 \text{ fourths} + 3 \text{ fourths} = 31 \text{ fourths}$ , or  $\frac{31}{4}$ .

5. Change  $5\frac{2}{7}$  to an improper fraction.

**RULE:** *To change a mixed number to an improper fraction, multiply the whole number by the denominator of the fraction and add the numerator of the fraction to the product.*

6. Reduce  $9\frac{5}{8}$  to 8ths.

7. Change  $4\frac{8}{21}$  to 21sts.

8. Change  $3\frac{5}{8}$  to an improper fraction.

9. Reduce to fractional form  $4\frac{7}{9}$ ,  $9\frac{3}{4}$ ,  $82\frac{5}{11}$ ,  $16\frac{24}{31}$ .

## TYPE XIV

## SUBTRACTION OF MIXED NUMBERS, THE FRACTION IN THE MINUEND BEING SMALLER THAN THE FRACTION IN THE SUBTRAHEND

1. From  $29\frac{1}{4}$  take  $15\frac{3}{8}$ .

		$1 = \frac{8}{8}$
		$+ \frac{2}{8}$
28		
<del>29</del> $\frac{1}{4}$	$\frac{2}{8}$	$\frac{10}{8}$
$15\frac{3}{8}$	$\frac{3}{8}$	$-\frac{3}{8}$
<hr/>		
$13\frac{7}{8}$		$\frac{7}{8}$

(a) Change the fractions to a common denominator.

(b) Since the fraction  $\frac{2}{8}$  in the minuend is smaller than the fraction  $\frac{3}{8}$  in the subtrahend, take 1 from the whole number 29, leaving 28. That 1 equals  $\frac{8}{8}$ .(c) Adding the  $\frac{2}{8}$  in the minuend to  $\frac{8}{8}$  gives  $\frac{10}{8}$ . Subtracting  $\frac{3}{8}$  in the subtrahend from  $\frac{10}{8}$  leaves  $\frac{7}{8}$ .(d) Subtracting the whole number 15 from 28 leaves 13. The whole answer is  $13\frac{7}{8}$ .2. Subtract  $1\frac{2}{3}$  from  $3\frac{1}{4}$ .3.  $7\frac{1}{5} - 3\frac{7}{10} = ?$ 4.  $12\frac{7}{4} - 9\frac{7}{8} = ?$ 5. From  $9\frac{3}{11}$  take  $3\frac{10}{3}$ .6. Subtract  $1\frac{2}{3}$  from  $3\frac{1}{6}$ .7. From  $16\frac{1}{6}$  take  $5\frac{5}{12}$ .

## TYPE XV

*Teach the use of the horizontal line between a dividend and a divisor in problems involving multiplication and division.*

1. Divide  $15 \times 24$  by 12.

$$(a) 15 \times 24 = 360.$$

$$(b) 360 \div 12 = 30.$$

This may be expressed in a single operation by writing the dividend ( $15 \times 24$ ) above a horizontal line and the divisor (12) below the line, thus:

$$\frac{15 \times 24}{12}.$$

The problem is now expressed in the form of a fraction. The numerator is  $15 \times 24$ . The denominator is 12. Since both numerator and denominator of a fraction may be divided by the same number without changing the value of the fraction, we may divide both terms of the fraction

$$\frac{15 \times 24}{12} \text{ by } 12.$$

$$\frac{15 \times \overset{2}{\cancel{24}}}{\underset{1}{\cancel{12}}} = \frac{15 \times 2}{1} = \frac{30}{1} = 30.$$

2. Divide  $16 \times 18$  by  $6 \times 4$ .

$$\frac{16 \times 18}{6 \times 4} = \frac{\overset{4}{\cancel{16}} \times \overset{3}{\cancel{18}}}{\underset{1}{\cancel{6}} \times \underset{1}{\cancel{4}}} = \frac{4 \times 3}{1 \times 1} = \frac{12}{1} = 12.$$

By inspection we see that 6 is a factor of 18 in the numerator and 6 in the denominator. 4 is also a factor of 16 and 4.

TYPE XV—*Continued*

Divide both numerator and denominator by the common factors 6 and 4.

$$3. \frac{36 \times 18}{24} = ?$$

$$(A) \quad \frac{\overset{3}{\cancel{36}} \times 18}{\underset{2}{\cancel{24}}} = \frac{3 \times 18}{2} = ?$$

(A) By inspection we see that 12 is a common factor of both 36 and 24. Divide both terms by 12.

$$(B) \quad \frac{3 \times \overset{9}{\cancel{18}}}{\underset{1}{\cancel{2}}} = \frac{3 \times 9}{1} = \frac{27}{1} = 27.$$

(B) 2 is a common factor of 18 and 2. Divide both terms by 2.

(A) and (B) may be expressed in one operation

$$\frac{\overset{3}{\cancel{36}} \times \overset{9}{\cancel{18}}}{\underset{1}{\cancel{24}}} = \frac{3 \times 9}{1} = 27.$$

4. A farmer exchanged 18 bbl. of apples at \$3 a barrel for flour at \$6 a barrel. How many barrels of flour did he receive in exchange? Solve this problem by the above method.

$$\frac{\overset{3}{\cancel{18}} \times 3}{\underset{1}{\cancel{6}}} = \frac{9}{1} = 9.$$

The value of the apples ( $18 \times 3$ ) is the dividend. The value of one barrel of flour (\$6) is the divisor.

$$5. \frac{25 \times 16}{8} = ?$$

$$6. \frac{16 \times 21}{12} = ?$$

$$7. \frac{32 \times 24}{8 \times 3} = ?$$

8. How many cords of wood at \$6 a cord are equal in value to 36 bbl. of potatoes at \$3 a barrel?

## TYPE XVI

GIVEN THE COST OF MANY TO FIND THE COST OF MANY  
(CANCELLATION)

NOTE TO THE TEACHER: *Call the attention of the pupils to the difference between Types XV and XVI.*

1. If 4 apples cost 20¢, what will 5 apples cost?

$$20 \div 4 \text{ or } \frac{20}{4} = \text{cost of one apple.}$$

$$\frac{20}{4} \times 5 \text{ or } \frac{20 \times 5}{4} = \text{cost of 5 apples.}$$

$$\frac{20 \times 5}{4} = \frac{25}{1} = 25 \text{ cents.}$$

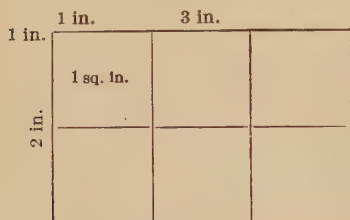
2. If 8 chairs cost \$32, what will 15 chairs cost?
3. What will 16 books cost, if 2 books cost \$3?
4. At the rate of 6 oranges for 25¢, what must I pay for 18 oranges?
5. If there are 72 in. in 6 ft., how many inches are there in 18 ft.?
6. If 360 qt. of milk are contained in 9 cans, how many quarts will 11 cans of the same size contain?
7. A merchant sold 32 yd. of cloth for \$48. What would he receive for 10 yd. at the same price?

## TYPE XVII

*Teach the term area.*

*Teach the units square inch, square foot, square yard. Have pupils measure sheets of paper, desk tops, a blackboard, etc., and apply units taught.*

1. How many square inches are there in a sheet of paper 2 in. wide and 3 in. long?



(A) By applying the unit of measure, 1 sq. in., to the length of the surface we find that there are 3 sq. in. in one row of squares.

(B) By applying the same unit across the width of the surface we find that there are 2 rows of squares.

Since there are 3 sq. in. in one row, and there are two rows of squares, the whole area will contain  $2 \times 3$  sq. in. = 6 sq. in.

2. How many square inches are there on a desk top 30 in. long and 16 in. wide?

3. How many square feet are there on the floor of a room 18 ft. long and 15 ft. wide?

4. A lawn is 24 yd. long and 15 yd. wide. How many square yards are there on the lawn?

5. What is the area of a brick wall 80 ft. long and 36 ft. high?

6. At 10¢ a square foot, what is the cost of sodding a plot 45 ft. long and 30 ft. wide?

7. What will be the cost of plastering a wall 16 yd. long and 5 yd. wide, at 35¢ a square yard?

## TYPE XVIII

MULTIPLICATION OF AN INTEGER BY A MIXED NUMBER  
CONSISTING OF A UNIT, AND A FRACTION WHOSE  
NUMERATOR IS A UNIT

1. Multiply 12 by  $1\frac{1}{2}$ .

$$\begin{array}{r} 12 \\ 1\frac{1}{2} \\ \hline \end{array}$$

6

A. Find  $\frac{1}{2}$  of 12.  $\frac{1}{2}$  of 12 = 6.

12

B. Multiply 12 by 1.  $1 \times 12 = 12$ .

18

Ans.

C. Add 6 and 12.  $6 + 12 = 18$ . Ans.

To multiply an integer by  $1\frac{1}{2}$ ,  $1\frac{1}{3}$ ,  $1\frac{1}{4}$ , etc., first multiply the integer by the fraction; second, multiply the integer by the unit; third, add the two products.

2.  $48 \times 1\frac{1}{4} = ?$

3. Multiply 36 by  $1\frac{1}{3}$ .

4. What is the product when 30 is multiplied by  $1\frac{1}{5}$ ?

5.  $95 \times 1\frac{1}{5} = ?$

6. 60

7. 72

8. 96

9. 64

$\times 1\frac{1}{3}$

$\times 1\frac{1}{2}$

$\times 1\frac{1}{6}$

$\times 1\frac{1}{4}$

10. What will 24 books cost at  $\$1\frac{1}{2}$  each?

## REVIEWS FROM FOURTH YEAR—SECOND HALF

## REVIEW A

1.  $104,976 \div 243 = ?$
2.  $109,782 \div 321 = ?$
3.  $643 \times 208 = ?$
4.  $594 \times 405 = ?$
5. Change  $\frac{32}{48}$ ,  $\frac{54}{144}$ ,  $\frac{40}{96}$  to lower terms.
6. Change to 48ths:  $\frac{1}{6}$ ,  $\frac{2}{3}$ ,  $\frac{5}{12}$ ,  $\frac{3}{8}$ .
7. Add  $1\frac{11}{30}$  and  $31\frac{1}{30}$ , and subtract  $17\frac{7}{30}$  from the sum.
8.  $96\frac{2}{25} + 88\frac{7}{25} + 39\frac{1}{25} + 47\frac{3}{25} = ?$
9. If I can save \$104.51 in 7 mo., how much can I save in a year?
10. How much will be left from \$100 after spending \$3.60, \$11.17, 50 cents, \$1.96, \$6.40, \$8.33, \$29.08, and 98 cents?
11. A man is paid a salary of \$2160. If he works only 288 days in a year, how much does he receive per day?
12. It takes a postman 6 hours for the collection of mail, but an automobile can do it in  $\frac{2}{5}$  of the time. How many minutes does the auto save?
13.  $95,876 + 10,795 + 795 + 6589 + 117,894 = ?$
14. Find the difference between six thousand eight hundred sixty-five and seven thousand two hundred forty-one.
15.  $134,784 \div 234 = ?$
16.  $83,790 \div 342 = ?$
17.  $958 \times 304 = ?$
18.  $687 \times 579 = ?$

REVIEW A—*Continued*

19. Add  $69\frac{9}{35}$  and  $58\frac{7}{5}$ . (b) From  $94\frac{18}{5}$  take  $47\frac{11}{5}$ .

20. Reduce  $\frac{48}{34}$ ,  $\frac{33}{90}$ ,  $\frac{27}{75}$ ,  $\frac{15}{54}$ ,  $\frac{14}{28}$ ,  $\frac{28}{44}$  to lower terms.

21. Change to 72nds:  $\frac{8}{9}$ ,  $\frac{7}{12}$ ,  $\frac{5}{6}$ ,  $\frac{3}{4}$ ,  $\frac{1}{3}$ ,  $\frac{5}{8}$ ,  $\frac{7}{18}$ ,  $\frac{5}{24}$ .

22. A man died in 1871 at the age of 86. In what year was he born?

23. A man had 96 horses. Three died and the others were sold at \$105 each. What sum was received for them?

24. A man having \$10,000, kept \$307 and with the rest bought land at \$359 an acre. How many acres did he buy?

25. How many machines worth \$45 each, equal the value of 117 watches at \$65 each?

26. How many 20-gallon casks can be filled from 395 bbl. of molasses of 48 gal. each?

27. A man drew \$22,500 from the bank. He spent  $\frac{5}{9}$  of it for a farm and the remainder for a house. How much did he spend for each?

28. At 20¢ a quart, what is the value of 4 bu. of chestnuts?

29. A lady bought 24 yd. of silk for \$34.80. How much would 65 yd. cost at the same price per yard?

30. If an automobile runs 254 mi. a day, how many whole days will it take it to run to San Francisco, a distance of 3097 mi., and how many miles would be left for the last day?

31. Find the cost of 4 doz. lemons at 3¢ apiece.

32.  $243,648 \div 576 = ?$

REVIEW A—*Continued*

33.  $232,578 \div 657 = ?$

34.  $975 \times 509 = ?$

35.  $867 \times 684 = ?$

36. A man bought 360 sheep. He sold  $\frac{3}{5}$  of them at \$4.35 each. How much did he receive for them?

37. Frank earned \$17, which was \$8.75 more than Harry earned. How much did Harry earn?

38. The sum of two numbers is 7423, and one of them is 2567. What is the other?

39. A stock dealer bought 465 sheep at \$4.85 a head and sold them all for \$2875. How much did he gain or lose?

40. Add XLVII, XCIV, CCLXIX, CXCIX, CCXXVIII

## REVIEW B

1. Find the sum of 2198, 587, 1059, 2165, 388, and 2469.
2. One loaf of bread will feed 3 men a day. How many loaves will be needed for 30 men for a week?
3. Traveling at the rate of 42 mi. an hour, a train can reach Chicago in 24 hours. How fast must it run per hour to arrive there in 18 hr.?
4. Subtract twenty-four thousand three hundred five from one hundred sixteen thousand twenty-two.
5. A day's work for an engineer is 138 mi. During this month he has a mileage of 3726 mi. At \$4 a day what did he earn?
6.  $389 \times 204 = ?$
7. If a train ran continuously for 2 days at 30 mi. an hour, how far would it go?
8. Divide 119,552 by 467.
9. A dealer bought 5 doz. ties at \$1.95 per dozen, 4 doz. hats at \$22 per dozen, and 2 doz. overalls at \$4 per dozen. What was the total cost?
10. He sold the ties at 25¢ each, the hats at \$2.50 each, and the overalls at 60¢ per pair. What did he receive for all?
11.  $16,872 + 19,005 + 8267 + 23,584 + 995 + 18,096 = ?$
12. A speculator bought 125 acres of land at \$60 an acre. He spent \$1250 in fencing it and then sold it at a gain of \$1000 over all the cost. For what did he sell it?

REVIEW B—*Continued*

13.  $63,017 - 28,759 = ?$

14. What is the value of 3 bales of cotton, each weighing 397 lb., at 9¢ a pound?

15. Multiply one hundred seventy-nine by five hundred eight.

16. I bought 2 shirts @ \$1.25, 2 shirts @ \$.88, 6 collars at \$1.50 a dozen, 1 tie for 75¢. What change did I receive from \$10?

17.  $427,302 \div 579 = ?$

18. There are 4 tubs of butter weighing  $39\frac{5}{8}$  lb.,  $35\frac{7}{8}$  lb.,  $31\frac{1}{4}$  lb., and  $33\frac{1}{2}$  lb. How much do they all weigh?

19. A huckster bought 18 bu. of apples at 80¢ a bushel. He sold 8 bu. at 30¢ a peck and the remainder at 40¢ a peck. What was his gain?

20. Add six thousand ninety; two thousand one hundred five; five hundred seventy-nine; one thousand sixty-eight; six hundred fifty-four; two thousand sixty-nine.

21. What is the cost of 8 oz. of butter @ 32¢ a pound and 4 oz. of tea at 64¢ a pound?

22. Find the difference between 35,879 and 123,451.

23. A grocer bought a 10-gal. can of milk for \$1.50. He retailed it at 6¢ a quart. How much was his gain?

24.  $547 \times 59 = ?$

25. Find the cost of  $\frac{7}{12}$  of an acre of land at \$84 an acre.

26. Multiply 24 by 54 and divide the product by 36.

REVIEW B—*Continued*

27. A street is 352 yd. long. How many feet long is it?
28.  $8793 \text{ plus } 3859 - 8976 = ?$
29. I bought sugar for 32¢, tea for 38¢, coffee for 34¢, eggs for 36¢, butter for 43¢. What change did I receive from \$2?
30. Find the difference between the sum of 8670 and 654 and the sum of 639 and 784.
31. A farmer has his land in four parcels containing  $7\frac{1}{6}$  acres,  $15\frac{3}{8}$  acres,  $9\frac{5}{12}$  acres, and  $24\frac{1}{2}$  acres. How many acres has he in all?
32. A man's income is \$1800 a year. His average expenses are \$116.50 a month. How much can he save in a year?
33. Write in Roman numerals 375, 483, 224.
34. Add  $43\frac{3}{4}$  and  $15\frac{5}{8}$ .
35. A merchant's receipts for the week are as follows: \$17.83, \$32.17, \$58.85, \$19.67, \$27.91, \$75.83. What are his total receipts?
36. Subtract  $27\frac{2}{3}$  from  $41\frac{3}{4}$ .
37. What is the product of 315 times 89?
38. Georgia has an area of 59,475 sq. mi., New York has an area of 49,170 sq.mi. How much larger is Georgia than New York?
39. How many yards in 624 ft.?
40. A contractor completed in one week  $1\frac{3}{4}$  mi. of road; the next week  $2\frac{1}{8}$  mi., the next,  $1\frac{1}{2}$  mi., and the

REVIEW B—*Continued*

next,  $1\frac{5}{8}$  mi. How many miles were done in the four weeks?

41. A farmer had 63 cows.  $\frac{2}{3}$  of them died. He sold the remainder @ \$35 each. How much did he receive?

42. Four casks were gauged and marked as follows:  $31\frac{1}{2}$  gal.,  $31\frac{5}{8}$  gal.,  $31\frac{1}{4}$  gal.,  $31\frac{9}{16}$  gal. What was the total capacity of the four casks?

43. If 6 bbl. of flour cost \$58.80, what will 5 bbl. cost?

44. A picture has two sides, each  $12\frac{1}{2}$  in. long, and two sides, each  $8\frac{3}{4}$  in. long. How many inches of molding will it take to frame it? (diagram)

45. A dealer bought 46 tons of coal @ \$4.75 a ton. If he sells it at \$6.25 a ton, how much will he gain?

46. A man owning  $51\frac{7}{8}$  acres of land sold  $12\frac{1}{2}$  acres. How much had he left?

47. A man has \$160. How many days at \$5 per day must he work to increase that sum to \$500?

48. A butcher bought 71 lb. of beef at 11¢, 42 lb. of bacon at 16¢, and 34 lb. of pork at 12¢. How much was his bill?

49. A farmer exchanged 84 doz. eggs for 20 yd. of carpet @ 63¢ a yard. What were the eggs worth per dozen?

50. Divide 436,158 by 738.

## REVIEW C

1. Add 38,169; 215,976; 59,547; 165,854; 5815; 109,747.

2. Find the difference between six hundred twenty thousand fifteen, and fifty-eight thousand seven hundred seven.

3. An importer brought into this country 275 fox skins valued at \$14.75 each. What did they all cost?

4. He had to pay at the port of entry a tax of  $\frac{1}{5}$  of the value. How much tax did he pay?

5. Divide 535,806 by 927.

6. A grain dealer received to-day as follows:  $539\frac{1}{2}$  bu.,  $487\frac{3}{4}$  bu.,  $473\frac{5}{8}$  bu.,  $563\frac{2}{3}$  bu. What were his total receipts?

7. My house lot is  $119\frac{1}{8}$  ft. wide. If I sell my neighbor a strip  $5\frac{3}{4}$  ft. wide, what will be the width of my lot then?

8. I have a piece of wood 42 in. long. If I cut 3 pieces from it, measuring  $10\frac{1}{2}$  in.,  $12\frac{3}{8}$  in., and  $18\frac{3}{4}$  in., how much will be left?

9. Write in Roman numerals 47, 194, 209, 538.

10. A boy worked 9 days at 15¢ a day. He spent  $\frac{1}{5}$  of the money for marbles at 2 for 1¢. How many marbles did he buy?

11. Add twenty-thousand seven; two hundred nine thousand ninety; eight thousand six hundred one; fifteen thousand two; one thousand eight hundred.

REVIEW C—*Continued*

12. The receipts from a football game were \$19,042.16. The expenses were \$9485.79. What were the net receipts?

13. Multiply 859 by 476.

14. A sailing vessel made a trip of 13,483 mi. to San Francisco. At the rate of 139 mi. per day, how many days did it take?

15. A falling body falls  $16\frac{1}{2}$  ft. the first second,  $48\frac{1}{4}$  ft. the second, and  $80\frac{5}{2}$  ft. the third. How far does it fall in the first three seconds?

16. One tree is  $50\frac{3}{8}$  ft. tall; another is  $48\frac{3}{4}$  ft. What is the difference in the height of the two trees?

17. It is 143 mi. from New York to Albany. If it is  $40\frac{1}{2}$  mi. from New York to Peekskill and  $33\frac{5}{8}$  mi. more to Poughkeepsie, how many miles is it from Poughkeepsie to Albany?

18. A train ran 88 ft. a second. At that rate how many miles will it run in a minute?

19. I paid \$2.52 for 3 doz. Japanese lanterns. Find the cost of each.

20. A man bought a house costing \$4500. He paid  $\frac{1}{4}$  of the cost the first year,  $\frac{1}{3}$  the next year,  $\frac{1}{3}$  the next, and the balance the fourth year. How much did he pay the last year?

21.  $7694 + 3857 + 1729 - 5897 = ?$

22. The cost of maintaining the various departments of a city was \$756,000. Of this sum,  $\frac{2}{5}$  was for schools,

REVIEW C—*Continued*

$\frac{1}{4}$  for streets, and  $\frac{1}{10}$  for fire protection. Find the amount needed for each department mentioned.

23. A dealer imported 40,000 cigars. They cost him 4¢ each. The government tax amounted to \$300. He sold them at 8¢ each. Find his gain.

24. A firm used 828,360 lb. of cotton in 312 days. What was the average amount used per day?

25. Write in words 201,007.

26. The receipts for 29 days were \$8631.27. At that rate, what will they amount to in 89 days?

27. A tub of butter weighs  $31\frac{1}{8}$  lb. The tub alone weighs  $2\frac{1}{2}$  lb. What is the weight of the butter?

28. A barrel of flour weighs 196 lb. What is half a barrel of flour worth at 4¢ a pound?

29. A bag of flour is  $\frac{1}{8}$  of a barrel. If a barrel sells for \$6.80, what is the value of a bag?

30. In a certain district, a company collected 5875 qt. of milk. How many 10-gallon cans can be filled and how much will remain?

31. I bought soap for 55¢, a broom for 35¢, pails for 80¢, brushes for 48¢ and ammonia for 25¢. What change should I receive from \$5?

32. The divisor is 386; the quotient is 579. Find the dividend.

33. The sum of two numbers is  $17\frac{3}{4}$ . One number is  $8\frac{5}{8}$ . What is the other?

REVIEW C—*Continued*

34. Subtrahend,  $57\frac{4}{5}$ ; remainder,  $68\frac{2}{3}$ . Find the minuend.

35. The greater of two numbers is  $13\frac{7}{10}$ . The sum of the two is  $21\frac{5}{12}$ . What is the lesser number?

36. A person can read 12 pages an hour. How long will it take him to read a book of 912 pages, if he reads 4 hr. a day?

37. A clock ticks every second. How many times does it tick every hour? How many times does it tick in a day?

38. If a man smokes 2 cigars a day, how much will his tobacco cost him for April, if he pays 25¢ for each 3 cigars?

39. A commission merchant received 500 bu. of apples. He put them into baskets holding 2 pk. each and sold them at 25¢ a basket. How much did he receive?

40. The distance around two sides of a field is 712 ft. If the field is 267 ft. wide, how long is it?

41. A man bought 149 acres of land for \$7599 and sold it at \$65 an acre. How much did he gain?

42. A dealer sold 48 bu. of potatoes for \$36.48. At what price were they sold?

43. A miller sold flour for \$2423 and gained \$436.72. Would he have gained or lost and how much if he had sold it for \$2000?

44. A man having a farm of 121 acres sold  $38\frac{3}{8}$  acres. How many acres had he left?

REVIEW C—*Continued*

45. A coal dealer has received 5 carloads containing  $42\frac{3}{4}$  tons,  $45\frac{1}{2}$  tons,  $39\frac{7}{10}$  tons,  $38\frac{4}{5}$  tons, and  $41\frac{5}{8}$  tons. How many tons has he received?

46. Change  $123\frac{11}{16}$  to an improper fraction.

47. Change  $\frac{9}{11}$  to a fraction with 44 for the denominator.

48. Subtrahend,  $6\frac{7}{8}$ ; difference,  $13\frac{9}{10}$ . Find the minuend.

49. From the sum of  $6\frac{2}{3}$  and  $19\frac{5}{8}$  take the sum of  $12\frac{7}{8}$  and  $5\frac{3}{4}$ .

50. The quotient is 795; the divisor is 89. Find the dividend.

## REVIEW D

1. How much does a person lack of having \$50, if he has 3 five-dollar bills, seven 2's, four 1's, 3 half-dollars, 5 quarters, and 4 five-cent pieces?

2 A. dealer sold 47 beeves, averaging 874 lb., each at 7¢ a pound. How much was received?

3. A man received \$54 for 12 days' work. How much did he receive for 8 days' work?

4. If 12 pieces of cloth, each piece containing 15 yd., cost \$360, what do 24 yd. cost?

5. Divide  $81 \times 44$  by 99.

6. Simplify  $768 + 354 - 168 - 243 + 784 - 186 + 628$ .

7. A man sold a house for \$4875 and lost \$465. How much did he pay for it?

8. A man gave his son \$4750 and his daughter \$975 less. How much did he give to both?

9. At 6¢ a quart, how much will 33 gal. of milk cost?

10. How many dozen blank books will it take to supply the pupils in 12 class-rooms of 43 pupils each, if each pupil is to have 2 books?

11. How many gallons of milk does your mother use in September, if she uses 2 qt. a day?

12. What sum of money must be added to \$285.38 to make three hundred twenty-five dollars?

13. A man bought a house for \$5600 and an auto for  $\frac{5}{10}$  as much. How much did the auto cost?

REVIEW D—*Continued*

14. A man bought 128 acres at \$8 an acre. He sold  $\frac{1}{4}$  of it at \$25 an acre and the remainder at \$5 an acre. How much did he gain?

15. A farmer sold 125 sheep, lost 39, and had 209 left. How many did he have at first?

16. If a man earns \$1250 a year and spends \$95 each month, how much can he save in 5 yr.?

17. How much is gained on 12,675 lb. of wool bought @ 19¢ and sold @ 23¢?

18. If 6 acres cost \$750, what will 19 acres cost at the same rate?

19. A man having \$7200 in the bank, drew out  $\frac{4}{5}$  of it. He spent  $\frac{3}{4}$  of what he drew out for a house and the remainder for an auto. How much did the auto cost?

20. At 36¢ a dozen, how many eggs can be bought for 90¢?

21. If 6 yd. of silk cost \$9, what will 8 yd. cost? (Cancellation.)

22. A piece of paper is 4 ft. long and half as wide. How many square inches in it?

23. How many pieces of ribbon, each 18 in. long, can be cut from a piece 7 yd. long?

24. A man bought land at \$15 an acre and paid \$1350 for it. He sold it at \$18.75 an acre. How many acres did he have and how much did he gain?

25. A boat lacks 3 in. of being 25 ft. long. How long is it?

REVIEW D—*Continued*

26. If a man feeds his horse 8 qt. of oats a day, how long will 16 bu. last?

27. If a horse eats a peck of oats a day, how many bushels will a stable keeper need to feed 16 horses for two weeks?

28.  $29\frac{7}{8} + 28\frac{5}{6} + 35\frac{3}{4} - 79\frac{1}{2} = ?$

29. What is the difference between the sum of  $19\frac{4}{5}$  and  $25\frac{4}{5}$ , and the sum of  $35\frac{2}{5}$  and  $49\frac{1}{2}$ ?

30. Add 4869, 3794, 1578, 5685, 2456, 7249.

31. Simplify  $5932 + 6897 - 3257 + 4687 - 5934$ .

32. In a certain town there are 579 men, 68 more women than men, and as many children as men and women together. What is the population of the town?

33. The operating expenses of a street railway company for the year were \$125,103.75. How much was it per day?

34. A delivery auto ran 28 days at an average of 40 mi. per day and a total cost of \$44.80. What was the average cost per mile?

35. A flour mill produces each hour 560 sacks of 7 lb. each. If this flour was packed in barrels of 196 lb. each, how many barrels would be filled?

36. A dealer sold 624 lb. of butter for \$187.20 and gained 3¢ a pound. What did it cost him per pound?

37. How many square feet are there in a lot 125 ft. by 33 ft.?

REVIEW D—*Continued*

38. How many lots, each containing 7260 sq. ft., can be cut from 3 acres of 43,560 sq. ft. each?

39. The product of two numbers is 5106. One number is 69. What is the other?

40. Change  $\frac{537}{13}$  to a mixed number.

41. Write the Roman numerals for 814, 759, 661.

42. A wholesaler bought 5 carloads of coal, each weighing 50 long tons of 2240 lb. each. How many pounds did he buy?

43. If he sold it by the short ton of 2000 lb. each, how many tons did he sell?

44. A man walked  $37\frac{5}{8}$  mi. one day and  $7\frac{3}{4}$  mi. less the next. How many miles did he walk in both days?

45. If 10 bu. of potatoes cost \$8, what will 75 bu. cost?

46. At 60¢ a bushel, what should I pay for 2 pk. of corn?

47. How many square feet are there in a sidewalk 25 yd. long and 2 yd. wide?

48. From  $\frac{7}{8}$  of 776 take  $\frac{5}{6}$  of 558.

49. A farmer raised 675 bu. of wheat and sold  $\frac{4}{5}$  of it at 95¢ a bushel. How much did he get for it?

50. Find the amount of this bill: 6 lb. sugar @ 7¢;  $\frac{1}{2}$  lb. tea @ 68¢; 2 lb. coffee @ 36¢; 2 doz. eggs @ 29¢; 3 boxes crackers @ 10¢; 3 lb. butter @ 37¢.

## REVIEW E

1. A room is 18 ft. square. How many square yards are there on the ceiling?

2. There are 966 pupils in a school.  $\frac{4}{7}$  of them are girls. Find the number of girls.

3. How long will 12 bu. of potatoes last a family, if it uses 3 qt. a day?

4. If 13 yd. cost \$6.24, what will  $\frac{3}{4}$  of a yard cost?

5. Into how many square inches can a piece of paper 2 ft. long and 8 in. wide be cut?

6. How much will 40 ft. of gold wire cost at 2¢ an inch?

7. When potatoes are 30¢ a peck, how much will  $2\frac{1}{2}$  bu. cost?

8. What will 15 doz. baseballs cost at \$1.25 each?

9. Divide 289,301 by 659.

10.  $79\frac{6}{7} + 58\frac{4}{5} + 84\frac{1}{2} = ?$

11. What will it cost to travel 78 mi. at  $1\frac{1}{2}$ ¢ a mile?

12. How many more square inches are there in a piece of paper 18 in. by 30 in., than in one 2 ft. long and 22 in. wide?

13. A field is 132 ft. long and  $\frac{1}{3}$  as wide. How many square feet does it contain?

14. How many 10-gallon cans of milk are needed to supply 96 customers, if each one takes a quart?

15. A foreman receives \$4.50 a day and each of 12 workmen  $\frac{4}{5}$  as much. What is the payroll for a week for the foreman and the men?

REVIEW E—*Continued*

16. A boy sold 30 doz. eggs. For 18 doz. he received 24¢ a dozen; for 6 doz., 22¢; and for the rest, 20¢. How much did he receive?

17. How much sugar at 6¢ a pound can you get for 18 doz. eggs valued at 24¢ a dozen?

18. If a man earns \$125 a month and spends \$116.25, how much can he save in 3 yr.?

19. A lady bought 8 yd. of silk for \$6.72. If she buys 5 yd. more, what will it all cost?

20. At 25¢ a dozen, what will it cost to supply 2 pencils each to 336 pupils?

21. I sold land for \$5750, gaining \$375. How much would I have gained or lost if I had sold it for \$5525?

22. A. earned \$36 in a week. This was 8 times as much as B. earned. How much did both earn?

23. A man earning \$180 a month is able to save  $\frac{1}{9}$  of it. How much can he save in 5 yr.?

24. I bought a set of books for \$56 on instalments, paying \$5 cash. If I pay \$3 a month, how long will it take me to pay for it?

25. A man bought 84 sheep at \$5 a head. He sold  $\frac{4}{7}$  of them at \$6 a head and the remainder at \$5.75. Find his gain.

26. A dealer received a bill of \$1320 for 55 automobile tires. What was the price of each tire?

27. How many square yards of oilcloth are required to cover a floor 21 ft. by 18 ft.?

REVIEW E—*Continued*

28. Find the cost of 324 books at \$2.75 each.

29. From sixty-one thousand eleven take forty-nine thousand five hundred forty-three.

30. A farmer sold 44 bbl. of potatoes for \$99. How much more would he have received, if he had sold them at \$2.50 a barrel?

31. If a stationer buys 142 blank books at 3¢ each and sells them at 5¢, how much does he gain?

32. How many tiles each a foot square will it take for a hall 25 ft. long and 15 ft. wide?

33. To what number must 37,698 be added to make 71,401?

34. What is the value of 39 bales of cotton, each weighing 487 lb. at 12¢ a pound?

35. 75 street cars carried 54,000 passengers in a day. If each car made 10 trips, what was the average number carried by each car on each trip?

36. It cost \$236,580 to construct 12 miles of railroad. What was the average cost per mile?

37. A real estate dealer paid \$4875 for land, at \$75 an acre. He sold a part of it for \$2550, at \$85 an acre. How many acres had he left?

38. A farm of 160 acres produces 45 bu. of corn to the acre. The whole crop is sold at 56¢ a bushel. What is received for it?

39. John has 64¢ and James has  $\frac{3}{4}$  as much. William has  $\frac{1}{2}$  as much as both. How much have they all?

REVIEW E—*Continued*

40.  $16\frac{2}{3} + 15\frac{3}{4} + 29\frac{5}{6} - 38\frac{1}{2} = ?$

41. Add forty thousand three; ninety thousand nine hundred; seven hundred two thousand twenty; eighteen thousand seventy-nine.

42. What will be received for 10 gal. of milk at 3¢ a pint?

43. Add  $\frac{1}{2}$  yd.,  $2\frac{3}{4}$  ft., and 7 in.

44. Write in Roman numerals 944, 871, 980, 791, 555.

45. A pole is 78 ft. long.  $\frac{1}{6}$  of it is in the ground. How high does it extend above the ground?

46. Divide  $54 \times 42$  by  $108 \times 21$ .

47. Multiply 640 by 60.

48. Divide 530,100 by 190.

49. Add  $\frac{9}{16}$  of 496 and  $\frac{7}{12}$  of 504.

50. The cyclometer of a bicycle in the morning registered  $487\frac{7}{10}$  miles and in the evening  $561\frac{1}{10}$  mi. What was the day's run?

51. At \$1.28 a word, what will it cost to send a cablegram of 27 words?



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9	21	40
10	23	47
11	24	57
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# ANSWERS

## TYPE I

7. 2, 2, 3, 7
8. 2, 3, 7, 11
9. 2, 2, 3, 13
10. 2, 2, 2, 2, 3, 3, 3

## LESSON I

1. 2, 2, 2, 2, 2, 2, 3, 3
2. 2, 2, 2, 3, 11
3. 2, 2, 2, 3, 3, 3
4. 2, 2, 2, 3, 3, 5
5. 5, 3, 3, 3, 2, 2
6. 76
7.  $68\frac{5}{6}$
8.  $12\frac{3}{6}$
9. \$994.70
10. \$600

## TYPE II

2. 16,129,665
3. 3,015,167
4. 8,750,610
5. 23,916,927
6. 2,927,150
7. 3,455,783
8. 30,284,875
9. 34,981,644

## LESSON 2

1. 8,905,125
2. 2,799,117
3. 5, 5, 5, 7
4. 2, 5, 3, 3, 3
5. 3, 3, 2, 5, 11
6. 2, 2, 2, 5, 3, 3, 13
7. 448 sq. ft.
8.  $402\frac{1}{4}$
9.  $89\frac{1}{8}$
10. \$4535.34

## TYPE III

2. 180
3. 840
4. 270
5. 120
6. 180
7. 1440

## LESSON 3

1. 240
2. 120
3. 360
4. 240
5. 330
6. 2,819,833
7. 13,937,561

8.  $53\frac{1}{7}$

9.  $144\frac{1}{2}\frac{3}{0}$

10. \$7.50

## LESSON 4

1. 120
2. 2160
3.  $21\frac{1}{4}$
4.  $162\frac{7}{2}$
5.  $266\frac{1}{2}\frac{9}{0}$
6. \$90.95
7. 8160 mi.
8. 123,750
9. 305
10. 21,251,636

## Review I

1. 1800
2.  $214\frac{5}{8}\frac{3}{0}$
3.  $43\frac{2}{4}\frac{3}{4}$
4. 4410 sq. ft.
5. \$334.42
6. 143
7. 781
8. 60
9. \$67.54
10. 15,808,766

## LESSON 5

1. 2310
2. \$49.84
3.  $43\frac{5}{4}$
4. 21,696 sq. yd.
5. 1201
6. \$5.75
7. \$230.12
8. 3, 3, 2, 2, 2, 5
9. \$2.90
10. 11,298,632

## TYPE IV

3.  $19\frac{1}{2}$  lb.
4. \$12
5. \$90
6.  $18\frac{3}{4}$  yd.

## LESSON 6

1. 280
2.  $115\frac{1}{5}$
3.  $60\frac{5}{9}$
4. 20.
5.  $124\frac{5}{8}$
6. 360
7. 1260
8. 24 sq. yd.
9. 27
10.  $38\frac{2}{3}\frac{1}{2}$

## LESSON 7

1. 153
2. \$56
3.  $7\frac{1}{8}$  lb.

4.  $145\frac{5}{11}$  lb.

5. 2, 2, 2, 2, 2, 2, 3, 5

6. 8,808,756

7. 160

8.  $25\frac{5}{7}\frac{9}{2}$  yd.

9.  $22\frac{9}{16}$

10. 432

## TYPE V

2.  $4\frac{1}{2}\frac{1}{9}$
3.  $21\frac{1}{1}\frac{1}{7}$
4.  $1\frac{3}{9}\frac{4}{9}$
6.  $433\frac{7}{8}$
7.  $419\frac{8}{9}$
8.  $62\frac{1}{6}\frac{8}{8}$

## LESSON 8

1.  $173\frac{1}{2}\frac{9}{8}$
2.  $116\frac{8}{2}\frac{3}{0}\frac{7}{7}$
3.  $312\frac{1}{5}$
4.  $276\frac{1}{2}$
5. 432 sq. in.
6.  $85\frac{1}{3}$  rd.
7.  $6801\frac{7}{9}$
8. 2, 2, 5, 5, 7
9. \$7.68
10. \$5.60

## Review II

1. (7, 12), (7, 2, 2, 3)
2. 180
3.  $119\frac{1}{4}\frac{2}{2}$
4.  $48\frac{1}{5}$

5.  $2\frac{3}{16}$

6. \$1092

7. 6160

8. 270 lb.

9.  $4\frac{1}{4}$  mi.

10. 27¢

## LESSON 9

1.  $172\frac{1}{3}$
2.  $58\frac{1}{4}$  lb.
3.  $\frac{995}{22}, \frac{197}{12}$
4.  $145\frac{3}{17}, 32\frac{2}{7}$
5.  $164\frac{5}{8}$
6. 232,992
7. 63 yd.
8. 504
9.  $33\frac{4}{7}\frac{3}{2}$
10. \$18.90

## TYPE VI

2. 184
3. 88
4. 981
5.  $28\frac{7}{8}$
6. 39
8. \$15.01
9. 596
10. 644

## LESSON 10

1. 30
2. 246
3. 2610
4. 3700
5. 638,440

6.  $443\frac{101}{216}$
7. \$667.85
8. 553
9. 37,416
10.  $\$71\frac{1}{3}$

## LESSON 11

1. 12,144
2. \$125.76
3. 308
4.  $78\frac{19}{60}$  A.
5.  $54\frac{37}{120}$
6.  $\frac{1291}{14}$ ,  $1082\frac{1}{8}$
7.  $\frac{5}{11}$ ,  $\frac{3}{5}$ ,  $\frac{12}{19}$
8.  $\frac{30}{36}$
9. 11,879,327
10.  $11\frac{1}{24}$

## TYPE VII

2.  $5\frac{1}{3}$
3.  $\frac{16}{63}$
4. 3
5.  $7\frac{1}{9}$

## LESSON 12

1.  $2\frac{1}{7}$
2.  $25\frac{25}{51}$
3.  $4\frac{1}{2}$
4.  $1\frac{2}{5}$
5. 428
6. 164,838
7.  $65\frac{1}{9}$
8. \$18.28
9.  $266\frac{1}{7}$
10. 17,454,366

## Review III

1. 488 (+421)
2.  $\frac{317}{17}$ ,  $\frac{321}{13}$ ,  $\frac{51}{11}$
3. 255 (+\$10)
4. 128,544
5. 144
6.  $19\frac{13}{24}$
7. 15,600
8. 2096
9.  $21\frac{1}{3}$
10.  $\frac{21}{32}$ ,  $\frac{3}{5}$ ,  $\frac{8}{13}$

## Review A

1. 2, 2, 2, 3, 5, 7
2.  $342\frac{1}{20}$
3.  $12\frac{25}{48}$
4. \$771.63
5. 574
6. 240
7. 1,256,256
8.  $62,865\frac{85}{171}$
9. 840
10. \$3.87
11. \$151.52
12. 72
13. \$10.80
14.  $233\frac{1}{3}$
15.  $\frac{3}{4}$
16. \$3.15
17. 200
18. 3168
19. \$.81

20. 342
21. 4816
22. 29
23. 360
24. 2
25. 13,175
26. \$419.53
27.  $17\frac{1}{2}$
28. 143
29.  $36\frac{15}{56}$
30. \$23,996.25
31. 3336 and 79
32. 120
33. \$132
34. \$13.67
35. 400
36. 287
37. \$109.50
38. \$.12
39. \$84.24
40. \$3159
41.  $435\frac{3}{8}$
42. \$.10
43. \$3.35
44. 1695
45. \$10.89
46. \$25,000, \$10,000,  
\$10,000
47. 29, 31, 37, 41,  
43, 47
48.  $11\frac{7}{2}$
49. 105, 120, 140,  
252, 180, 43
50.  $54\frac{19}{24}$

## LESSON 13

1.  $1\frac{2}{3}$
2. 26
3.  $\$69\frac{1}{3}$
4. 8,500,644,  
24,846,005,  
14,508,222
5. 9,200,010
6.  $172\frac{1}{3}$
7.  $\frac{28}{96}, \frac{42}{144}$
8.  $40\frac{86}{105}$
9. \$1.40
10. \$74.88

## TYPE VIII

2.  $\frac{1}{12}$
3.  $\frac{1}{42}$
4.  $\frac{1}{24}$
7.  $\frac{1}{7}$
8.  $\frac{1}{16}$
10.  $\frac{3}{8}$
11. \$.30
12.  $\frac{7}{12}$

## LESSON 14

1. \$.50
2.  $\frac{2}{3}$
3.  $\frac{16}{63}$
4.  $\frac{19}{22}$
5. 80,213,477
6. MCCLX  
(MCMXV)
7. 7260, 5280
8. 10,560

9. \$31.50
10. 12,000

## LESSON 15

1.  $\frac{2}{5}$
2.  $\frac{21}{40}$
3.  $\frac{16}{25}$
4. \$.30
5. \$.15
6. 1800
7. \$.66
8.  $136\frac{13}{15}$
9.  $236\frac{8}{11}$
10. 396

## TYPE IX

2.  $6\frac{5}{12}$
3. 5
4. 12
5.  $194\frac{4}{9}$
6.  $6\frac{17}{24}$
7. 15
8.  $10\frac{4}{5}$
9.  $4\frac{1}{3}$
10. 10

## LESSON 16

1.  $2\frac{5}{14}$
2.  $\frac{35}{36}$  mi.
3.  $\$3\frac{9}{80}$
4. \$4.25
5.  $14\frac{7}{12}$
6.  $64\frac{7}{8}$

7.  $107\frac{8}{15}$
8.  $11\frac{1}{6}$
9. 1408
10. 15,000

## Review IV

1.  $8\frac{4}{7}$
2. 32
3. 296
4.  $121\frac{1}{2}$
5. 959,325
6. \$1.25
7. \$9.60
8. 938
9.  $4\frac{1}{3}$
10. \$3.20

## LESSON 17

1.  $14\frac{7}{24}$
2.  $17\frac{13}{35}$
3.  $16\frac{4}{5}$
4.  $\$137\frac{31}{32}$
5. 309 yd.
6. \$13,500
7.  $\$24\frac{15}{16}$
8. 729,636
9. 890,919
10. 2970 ft.

## TYPE X

2. \$117.50
3. 589
4.  $\$4.59\frac{3}{8}$
5. \$99

6. \$20
7. 135 bu.
8. \$11
9. \$42
10.  $203\frac{1}{7}$

## LESSON 18

1. \$68.25
2. \$462.50
3. \$4.50
4. 100
5.  $\frac{1}{6}, \frac{3}{4}, \frac{2}{5}, 1585$
6. 5280
7.  $5\frac{7}{12}$  yr.
8.  $13\frac{7}{40}$
9. \$60.48
10. 1,334,000

## LESSON 19

1.  $127\frac{1}{2}$
2.  $103\frac{5}{8}$
3. \$51.25
4.  $\$86\frac{1}{16}$
5. 275 bu.
6. \$37.50
7.  $\$37\frac{13}{16}$
8.  $22\frac{7}{44}$
9. \$1210.80
10.  $12\frac{11}{36}$  yd.

## LESSON 20

1. \$165
2. \$620.80

3. 624

4. \$13.75
5.  $140\frac{4}{57}$
6.  $377\frac{1}{2}$
7. \$789
8. MDCCCV
9. \$256.50
10. 48

## Review V

1. \$5.25
2. 53
3. 23,583
4. \$12.75
5. 18
6. 180 min.
7.  $\$213\frac{1}{3}$
8. \$51.12
9. 32
10. 1,338,256

## LESSON 21

1. \$60
2.  $27\frac{3}{14}$
3.  $\$113\frac{2}{3}$
4. \$118
5. \$5.65
6. \$7
7.  $21\frac{49}{90}$
8.  $11\frac{3}{2}$
9. 20
10. 524

## TYPE XI

2. 20¢
3. 30¢
5. \$37
6. \$1.20
7. \$1.86
8. \$2.10

## LESSON 22

1. \$5.50
2. \$2.15
3. \$1.75
4. \$3
5. \$4
6. \$4.75
7. 58
8. 749
9. 180,856,100
10. XLIX, CXIV,  
CCCXCVIII,  
MCV

## LESSON 23

1. 28¢
2. \$3.50
3. \$1.50
4. 10¢
5. \$45.25
6.  $\frac{112}{153}$
7. 15,300,691
8.  $5\frac{43}{84}$
9. \$23.65
10. 44

## LESSON 24

1. \$7
2. \$87.75
3. \$475
4. 5¢
5.  $\frac{1}{10}$
6. gain \$21.30
7. 352 sq. ft.
8. 1060 gal. 8480 pt.
9. \$15.36
10.  $10\frac{37}{81}$

## Review VI

1. XLV, CLIV, DXCI
2. \$10
3. \$1.98
4. 47
5. \$1.25
6. 34¢
7. \$2.
8. 26,821,176
9.  $9\frac{1}{12}$
10. 2

## Review B

1.  $\frac{1337}{10}$
2.  $270\frac{31}{8}$
3. 99¢
4. \$25.20
5.  $52\frac{9}{10}$
6. \$10.50

7. \$1.35
8. 638,301
9.  $1\frac{1}{2}$
10. 21 ft
11. 2, 7, 11
12. \$15
13. 1,549,537
14.  $4\frac{11}{9}$
15.  $313\frac{1}{2}$
16. DCXLIX
17.  $\$23\frac{5}{8}$
18.  $3\frac{1}{16}$
19. 21

20. \$4480
21. 2688
22. 73
23.  $116\frac{7}{12}$
24.  $214\frac{1}{2}$
25. 11
26. 28
27. \$2.55
28.  $39\frac{9}{5}$
29. 98 ft.
30. 784,913
31. 11
32. 52,034
33. 175
34. \$315
35. 216
36. 882
37. \$4308
38. 37¢
39. 10¢
40.  $\frac{3}{15}$

41. \$94.50
42. first by 3 sq. yd
43. \$14.40
44. 135 mi.
45.  $206\frac{1}{4}$  ft.
46.  $289\frac{1}{3}$
47.  $130\frac{4}{5}$
48.  $22\frac{5}{16}$
49. DCXCIX
50. \$38.46

## TYPE XII

2.  $\frac{1}{3}$
3.  $\frac{2}{3}$
4.  $\frac{5}{8}$
5.  $\frac{3}{5}$
6.  $\frac{3}{4}$ ¢
7.  $\frac{11}{12}, \frac{1}{12}$
8.  $\frac{8}{9}, \frac{1}{9}$

## LESSON 25

1.  $\frac{4}{21}$
2.  $\frac{13}{16}$
3.  $\frac{1}{3}$
4.  $\frac{1}{5}$
5.  $\frac{5}{18}$
6.  $\frac{9}{16}$
7. 903,008
8. 54,688,608
9. \$11.40
10.  $23\frac{2}{30}$

## LESSON 26

1.  $\frac{25}{97}$
2.  $\frac{1}{4}$
3.  $\frac{28}{73}$
4.  $\frac{1}{8}$
5.  $\frac{1}{2}$
6. 8
7.  $10\frac{27}{28}$
8. \$2.40
9. \$3.60
10. 114

## LESSON 27

1.  $\frac{44}{45}$
2.  $\frac{97}{122}$
3.  $\frac{3}{4}$
4.  $\frac{79}{100}$
5.  $\frac{7}{9}$
6.  $144\frac{11}{60}$
7.  $413\frac{19}{24}$
8.  $19\frac{3}{8}$
9.  $10\frac{1}{8}$
10. \$12

## LESSON 28

1.  $\frac{1}{16}$
2.  $\frac{9}{32}$
3.  $\frac{3}{20}$
4.  $\frac{2}{3}, \frac{1}{3}$
5.  $\frac{17}{30}$
6.  $30\frac{3}{8}$
7. \$7.05

8. \$143.72

9. 2736

10. \$960

## Review VII

1.  $\frac{10}{27}$
2.  $37\frac{2}{5}$  A.
3.  $\frac{3}{4}$
4. 608 sq. ft.
5.  $\frac{12}{35}$
6. 24
7.  $\frac{19}{96}$
8.  $72\frac{8}{45}$
9. 20¢
10. \$8.50

## TYPE XIII

3.  $\frac{7}{16}$
4.  $\frac{3}{20}$
5.  $\frac{1}{15}$
6.  $\frac{3}{20}$
7.  $\frac{1}{16}$
8.  $\frac{1}{8}$

## LESSON 29

1.  $\frac{1}{15}$
2.  $\frac{7}{100}$
3.  $\frac{5}{16}$
4.  $\frac{1}{5}$
5.  $\frac{2}{45}$
6.  $\frac{3}{4}$
7.  $\frac{5}{11}$

8. \$2040

9. \$3.40

10. DCLXVI, CDV,  
CMXCIX

## LESSON 30

1.  $\frac{1}{27}$
2.  $\frac{1}{48}$ ; 10¢
3.  $\frac{1}{10}$
4.  $\frac{3}{25}$
5.  $\frac{1}{12}$  bbl.
6.  $\frac{3}{4}$
7.  $\frac{3}{4}$
8.  $23\frac{1}{4}$  bu., 93 pk.,  
744 qt.
9.  $\frac{13}{31}$
10. \$91.20

## TYPE XIV

2.  $\frac{2}{3}$
3.  $\frac{2}{9}$
4.  $\frac{5}{18}$
5.  $\frac{9}{40}$
6.  $\frac{1}{8}$
7.  $\frac{1}{8}$
8.  $\frac{11}{48}$

## LESSON 31

1.  $\frac{1}{4}$
2.  $\frac{1}{8}$
3.  $\frac{39}{64}$
4.  $\frac{71}{64}$
5.  $\frac{22}{25}$

6.  $\frac{2}{9}$
7.  $\frac{43}{48}$
8. 24
9.  $1\frac{1}{2}\text{¢}$
10.  $2055\frac{114}{409}$

## LESSON 32

1.  $\frac{1}{16}$ , 16
2.  $\frac{3}{8}$
3.  $\frac{3}{4}$
4.  $\frac{137}{200}$
5.  $\frac{1}{4}$
6.  $\frac{245}{396}$
7. \$1.29
8. 75¢
9. Increased by  $\frac{5}{104}$
10.  $12\frac{2}{5}$

## Review VIII

1.  $\frac{3}{16}$
2.  $\frac{1}{16}$ , 16 times
3.  $\frac{1}{32}$
4. 64, 193,  
MCDXCII,  
CXLVI,  
LXXIV
5. \$227.50
6. \$6985
7.  $\frac{1}{5}$
8. \$13.70
9. \$6.40
10.  $12\frac{9}{21}$

## TYPE XV

2.  $14\frac{1}{5}$  A.
3. 40 A.
4.  $18\frac{3}{4}$  A.
5. 16
6. 5 A., 100 sq. rd.
7. 14 A., 4 sq. rd.
8. \$2500

## LESSON 33

1. 3 A.
2. \$343.75
3.  $30\frac{1}{5}$  A.
4. \$1125
5. 20 rd.
6.  $\frac{3}{32}$
7.  $\frac{6}{25}$
8. 330 ft.
9. \$40.60
10. 164,836

## LESSON 34

1.  $97\frac{21}{32}$
2. 32 rd.
3. \$348
4. 120 sq. rd.
5.  $\frac{5}{12}$
6.  $203\frac{1}{8}$  mi.
7. \$76.40
8.  $\frac{551}{4800}$
9.  $\frac{1}{4}$
10. 45

## LESSON 35

1. 29,680 sq. rd.
2. \$10,240
3.  $\frac{5}{8}$
4. 105 mi.
5.  $\frac{1}{8}$ ,  $\frac{24}{25}$
6.  $\frac{2}{9}$
7. \$6.80
8. 2, 2, 3, 3, 7, 7
9. \$51.70
10.  $\frac{3}{5}$

## LESSON 36

1. \$6037.50
2.  $\frac{8}{9}$ ,  $\frac{1}{9}$
3.  $\frac{1}{2}$
4. \$225
5. 3520 ft.
6. 644
7. 909, 777
8.  $\frac{7}{24}$
9.  $2\frac{2}{9}$
10. 18,400

## Review IX

1. \$2400
2. 528 ft.
3. 408
4.  $\frac{19}{20}$
5. 2, 2, 2, 3, 3, 11,  
13
6. 800 qt.
7. 45 rd.

8.  $\frac{9}{40}, \frac{2}{9}, \frac{27}{134}$   
 9. \$300  
 10. \$63

## Review C

1.  $\frac{4}{5}$   
 2.  $\frac{5}{12}c$   
 3. 1,505,006  
 4. 333,304  
 5.  $307\frac{6}{7}$   
 6.  $\frac{11}{16}$   
 7. 238  
 8. \$2934, 78 tons  
 9.  $\frac{2}{5}$   
 10. 2759  
 11.  $\frac{9}{7}$   
 12. \$2.50  
 13. 22 A.  
 14. \$75  
 15. 6241  
 16.  $116\frac{2}{3}$  mi.  
 17.  $133\frac{1}{3}$   
 18. 2, 3, 3, 3, 7, 11  
 19. 488,908  
 20.  $136\frac{7}{4}$   
 21.  $\frac{5}{8}$   
 22. 104  
 23.  $\frac{1}{160}$   
 24. 2735  
 25. 32  
 26. \$953.05  
 27. \$158.73  
 28. \$344.90  
 29. 2592

30. 7 and 43  
 31. 270  
 32. 90¢  
 33. 154 s., \$62 left  
 34. 219  
 35. \$1.92  
 36.  $5\frac{79}{80}$   
 37. \$10.39  
 38. 14,080 ft  
 39.  $\frac{5}{96}$   
 40. 82,031  
 41.  $\frac{61}{235}$   
 42. 15¢  
 43. \$405.20  
 44. \$560  
 45.  $\frac{4}{45}$   
 46. 2¢  
 47. 183 lb.  
 48. \$1125  
 49. 18 in. long, 10  
       in. wide  
 50.  $\$18\frac{1}{3}$

3. \$254.40  
 4. 140 ft.  
 5. \$17.52  
 6. 5 mi.  
 7.  $222\frac{8}{15}$  yd.  
 8.  $11\frac{1}{2}$   
 9.  $\frac{1}{8}$   
 10.  $5\frac{5}{64}$  sq.mi.

## LESSON 38

1. \$21.84  
 2. \$8.10  
 3. 196 sq. yd.  
 4. \$960  
 5. \$4.80  
 6. 12  
 7.  $\frac{2}{3}$   
 8. 72,353,685  
 9. 817 A.  
 10. No gain

## TYPE XVI

2. \$25.20  
 3. \$7.20  
 4. \$48  
 6. \$3.24  
 7. \$9.28  
 8. 584 yd.

## LESSON 37

1. 800 ft.  
 2. 160, \$560

## LESSON 39

1. 46 yd.  
 2. 104 ft.  
 3. 264  
 4. 86,991,916  
 5. \$95.80 (gain)  
 6. 2 oz.  
 7.  $\frac{3}{5}$  bu.  
 8. 96 rd.  
 9. \$1170  
 10. \$3456

## LESSON 40

1. 33
2. 396
3. 130,680
4.  $56\frac{1}{8}$
5.  $16\frac{2}{5}$
6. 3132 mi.
7. 13,556,645
8.  $3420\frac{117}{254}$
9. \$1.60

## Review X

1. \$1.52
2. \$12.25
3. \$90
4.  $6\frac{2}{3}$  min.
5. 24
6.  $\frac{1}{4}$
7.  $4786\frac{1}{12}$
8. 144 sq. ft.
9. \$31.50
10. \$14.40

## TYPE XVII

2. 10,570 ft.
3. 35 pk.
4. 162 qt.
5. 33 qt.
6. 33
7. 104 hr.
8. 24 da.
9. 650 oz.
10. 33 sq. ft.

## LESSON 41

1. 35 qt.
2. \$9.13
3. \$2.10
4. \$2.97
5. \$.42
6. \$85
7. \$8400
8. \$8.01
9. \$1.50
10. \$3.15

## LESSON 42

1. 163 qt.
2. 147 qt.
3. \$2.45
4. 70 oz.
5.  $\frac{18}{3}$
6. \$7.40
7. 2,862,032
8. \$5.12
9.  $185\frac{15}{398}$
10.  $66\frac{2}{3}\text{¢}$

## TYPE XVIII

2. 45
3. 19
4. 18
5. 71
1. 35
2. 108
3. 18
4. 8
5. 28

## LESSON 43

1. 835
2.  $21\frac{1}{2}$
3. 755
4. 612
5. 827
6. 1383, 644, 1455
7.  $45\frac{37}{140}$
8. \$10.56
9.  $\frac{1}{8}$
10. \$5376

## LESSON 44

1. 1677
2. 2917
3. 2370
4. \$1.20
5. 39,345,485
6. 784 sq. in.
7. \$2201.80
8.  $131\frac{3}{11}$  rd.
9. 84
10.  $\frac{1}{9}$

## Review XI

1. \$19
2. 22 pk.
3. 73
4. \$7.65
5. \$11.90
6. 0
7. \$3.38

8. \$2800
9. 96
10. 40 ft.

## LESSON 45

1. \$1.78
2. \$1.44
4. \$2.0¢
5. \$31.98
6. 284 in.
7. 200 qt.
8.  $211\frac{1}{4}$  mi.
9. \$196.80
10. 35,280 min. 588 hr.

## LESSON 46

1. \$23.15
2. \$10.95
3. \$17.14
4. 40
5.  $27\frac{4}{6}\frac{7}{3}$
6. 484,000
7. \$24
8.  $5\frac{4}{2}\frac{3}{3}$ ,  $50\frac{7}{9}$
9. 95¢
10. 170 sq. ft.  
24,480 sq. in.

## LESSON 47

1. \$26.80
2. \$22.77

3. \$10.20
4.  $1\frac{1}{3}\frac{9}{6}$ ,  $\frac{1}{30}$ ,  $\frac{2}{3}$

5.  $85\frac{1}{3}$  rd.
6. 130 pk.
7. \$3
8. 13,325,613
9.  $12\frac{1}{2}$  ft.
10. 1601 pt., 19 pk.

## LESSON 48

1. \$1.95
2. \$162
3. 709,029
4. \$20
5. 15 bu.
6. \$33.50
7.  $1\frac{7}{20}$
8.  $498\frac{7}{8}\frac{9}{9}$
9. 35
10.  $\frac{3}{4}\frac{2}{5}$

## Review XII

1. \$1.17
2. 33
3. \$1.57
4. 130
5. 504 sq. yd.
6. \$4.20
7. \$4.80
8.  $\frac{1}{3}$
9. 3
10.  $7977\frac{1}{5}\frac{1}{4}$

## Review D

1. \$192
2.  $213\frac{2}{3}\frac{3}{6}$
3. 800 A.
4. \$3.51
5. 98 ft.
6. \$253.05
7. 1,795,713
8.  $\frac{1}{16}$
9.  $27\frac{6}{6}\frac{1}{3}$
10. 52
11. 51,418
12.  $379\frac{1}{2}$
13. \$33.60
14. 200
15.  $\frac{2}{7}\frac{9}{7}$
16. 24 ft.
17. No diff.
18.  $\frac{1}{3}$
19. 2, 2, 2, 2, 3, 3,  
3, 13
20. 179
21. 10,639,807
22.  $\frac{1}{40}$
23. 69
24. \$1.25
25. \$3.15
26.  $\frac{3}{5}$
27.  $80\frac{1}{7}\frac{9}{2}$
28.  $376\frac{1}{2}$
29. 35
30. 72
31. 132 ft.
32. \$1.89

33. \$36,321.60

34. 15¢

35.  $1\frac{1}{4}$ 

36. 12 bbl.

37. 75 bbl.

38.  $348\frac{3}{4}$ 

39. \$12.18

40. 7500 sq. ft.

41. \$25.58

42.  $\frac{3}{10}$ 43.  $\frac{5}{8}$ 44.  $\frac{5}{9}$ 45.  $\frac{3}{8}$ 46.  $\frac{5}{12}$ 

47. \$2.07

48. \$274.15

49. 5625 sq. ft.

50. \$2.13

## LESSON 49

1. \$37.95

2. \$46

3. \$6.93

4. 88 sq. yd.

5. 355

6. \$8.13

7. \$168

8. 172

9. 29

10. 31,955,062

## LESSON 50

1. 360

2.  $\frac{199}{392}$ 

3. 156 mi.

4. 1848,

MCDXCII

6. 95¢

7. \$54.89

8. \$72.50

9.  $\frac{32}{45}$ 

10. 855 min.

## LESSON 51

1. \$142.25

2. 192

3. \$116.25

4.  $\frac{7}{20}$ 

5. 10,389,796

6. 528 ft.

7. \$68

8.  $33\frac{7}{17}$ 

9. \$122.87+

10. \$43.52

## LESSON 52

1. \$648

2.  $5\frac{4}{5}$ 3.  $1\frac{3}{64}$ 

4. 1200 yd.

5.  $32\frac{2}{13}$ ,  $11\frac{23}{40}$ , $6\frac{48}{65}$ 

6. 86¢

7. \$25

9.  $\frac{1}{5}$  yd.

10. 4,408,057

774

## REVIEW XIII

1. 3, 3, 5, 2, 2, 2,

13, 2

2.  $681\frac{13}{2}$ 

3. 15,852,896

4. \$141.09

5. 13

6. \$12.50

7. 735

8. \$37,125

9. 6¢

10. 1792

## LESSON 53

1.  $\frac{28}{49}$ 2.  $\frac{3}{4}$  tons

3. 76 mi.

4. \$5.90

5. 1,004,479

6. 1600 sq. in.

7. 242

8. \$440

9. 2, 2, 5, 29

10. 7,415,656

## LESSON 54

1. 1227 ft.

2. \$10.08

3. 56

4. 53¢

5. 83,160

6. 26

7. \$51,450

8. \$33,120, \$13,275  
 9. \$68  
 10.  $\frac{1}{16}$

## LESSON 55

1. \$33.60  
 2.  $8\frac{4}{8}$   
 3. 20  
 4.  $\frac{2}{5}$   
 5. \$288  
 6. 21,087  $\frac{44}{149}$   
 8. 46 pt.  
 9. 40  $\frac{1}{2}$  gal.  
 10. \$118.80

## LESSON 56

1. 187 pt.  
 2. \$.77  
 3. \$6.75  
 4. 72 yd.  
 5. 85¢  
 6. 124  $\frac{3}{4}$  sq. ft.  
 7. 4224 yd.  
 8.  $\frac{2}{15}$   
 9. 9  $\frac{1}{3}$   
 10. 9  $\frac{2}{9}$

## Review XIV

1. 16 rd.  
 2. 305 sq. rd.  
 3. 48, 94, 161,  
     LVI, CXI,  
     CCXLVI  
 4. \$3.03

5. 90  $\frac{1}{4}$ %

6. 13  $\frac{1}{2}$

7. 6327

8. 17  $\frac{9}{14}$

9. \$2.88

10. 81,199  $\frac{265}{359}$

## LESSON 57

1. 30  $\frac{5}{14}$

2.  $\frac{17}{18}$

3. 568  $\frac{1}{2}$

4.  $\frac{7}{12}$

5.  $\frac{2}{5}$

6. 134  $\frac{5}{12}$

7. 8  $\frac{23}{4}$

8. 1440

9. 43,200

10. 2,573,884

## LESSON 58

1. \$72

2. \$20.25

3. \$3.30

4. \$12.32

5. \$6.13

6. 70¢

7. 1333  $\frac{1}{3}$  bu.

8. \$3

9. 3, 3, 5, 5, 2, 2

10. 5547 sq. yd.

## LESSON 59

1. 300, 480, and 420

2. \$245.70

3. 56 yd.

4. \$8.45

5. \$2475

6. \$499.80

7. 400

8. \$22.95

9. 241,956

10. 7152

## LESSON 60

1. 16  $\frac{1}{3}$  ft.

2. 296 qt.

3. 1376 oz.

4. 247  $\frac{1}{3}$  yd.

5. 14 doz.

6. 436,705, 90,017

7.  $\frac{25}{48}$

8.  $\frac{32}{45}$

9.  $\frac{11}{24}$

10. 172 rd.

## Review XV

1.  $\frac{19}{48}$

2. 155  $\frac{1}{2}$  lb.

3.  $\frac{49}{960}$

4. 17  $\frac{2}{9}$

5. 80 ft.

6. \$9.60

7. 8358

8. 135 min.

9. 20  $\frac{1}{10}$

10. milk \$2.54 more

Review E	17. \$21.60	34. \$1778
1. \$84	18. 1171	35. \$32
2. 300 lb.	19. 48 rd.	36. $172\frac{7}{8}$
3. 1492	20. \$205.80	37. 72 in.
4. 1,200,000	21. 115	38. $\frac{1}{9}$
5. 100,000 gal.	22. \$11.25	39. 1,357,691
6. 63	23. 28	40. 75
7. 2,481,352	24. 204 mi.	41. $\frac{7}{10}$
8. 1386 ft.	25. \$18.02	42. $29\frac{6}{8}\frac{5}{4}$
9. 396 da.	26. $\frac{1}{2}\frac{1}{2}$	43. $\frac{1}{3}$
10. 1080 sq. in.	27. \$4375	44. \$277.82
11. $\frac{1}{20}$	28. 65 ft.	45. \$353.55
12. $16\frac{2}{3}$ doz.	29. \$28.20	46. \$8.91
13. $\frac{40}{63}$	30. 83,096	47. 406
14. 175	31. \$11.52	48. $365\frac{5}{8}$
15. 550	32. \$400	49. 4000
16. 6075	33. 1188 ft.	50. 612 sq. yd.

## DRILL ANSWERS

*Multiplication after**Review I**A*

- 1,546,035
- 1,069,952
- 1,051,675
- 2,492,316
- 6,323,562
- 706,380
- 1,970,520
- 1,331,858

*B*

- 922,013

- 1,692,642

- 1,622,213

- 1,273,704

- 772,254

- 839,983

- 309,792

- 1,261,519

*C*

- 6,821,738

- 777,105

- 6,250,272

- 1,908,301

- 914,312

- 8,835,057

- 529,603

*Multiplication after**Review II**A*

- 1,070,895

- 2,400,948

- 1,541,682

- 1,879,530

- 3,433,914

- 1,742,226

- 2,089,275

- 5,000,175

DRILL ANSWERS—*Continued*

9. 6,470,982
10. 2,782,542
11. 2,349,642

*B*

1. 6,170,463
2. 6,215,622
3. 6,371,783
4. 7,906,986
5. 1,343,076
6. 5,578,248
7. 2,736,855
8. 3,450,744
9. 3,076,656
10. 6,461,208
11. 3,849,954

*C*

1. 2,761,626
2. 3,145,743
3. 8,049,678
4. 5,855,286
5. 8,778,042
6. 7,810,026
7. 6,237,073
8. 6,994,332
9. 1,596,246
10. 9,658,782
11. 6,133,662

*D*

1. 4,752,102
2. 6,178,263

3. 6,069,965
4. 6,725,664
5. 4,178,228
6. 4,442,368
7. 5,884,448
8. 6,654,969
9. 5,244,612
10. 3,062,016
11. 4,649,046

*E*

1. 5,773,250
2. 3,452,430
3. 4,984,875
4. 4,308,472
5. 5,645,059
6. 5,147,403
7. 6,686,113
8. 6,439,648
9. 5,066,941
10. 3,825,833
11. 5,297,226

*F*

1. 1,144,373
2. 2,053,192
3. 1,424,124
4. 4,571,812
5. 4,782,414
6. 6,640,491
7. 6,057,270
8. 7,012,313

9. 8,445,465
10. 1,311,420
11. 2,028,666

*Division Drill  
after Review III**A*

1. 33,204
2. 4,329
3. 52,291
4. 48,691
5. 68,439
6. 12,473
7. 5,596
8. 12,475
9. 18,574
10. 607,031
11. 21,096
12. 80,097
13. 6,025

*B*

1. 307,129
2. 41,205
3. 83,065
4. 123,091
5. 71,709
6. 7,169
7. 207,168
8. 49,465
9. 130,816
10. 12,763

# DRILL ANSWERS—Continued

11. 21,435	4. 1,804,151	3. 2581
12. 112,853	5. 3,117,902	4. 3859
13. 150,037	6. 1,446,705	5. 4672
	7. 1,880,434	6. 8354
<i>Multiplication after</i>	8. 781,924	7. 9768
<i>Review A</i>	9. 1,963,190	8. 9612
<i>A</i>		9. 3692
1. 811,356	<i>Division after</i>	10. 3827
2. 2,011,488	<i>Review IV</i>	11. 5964
3. 30,103,956	<i>A</i>	12. 6485
4. 2,292,044	1. 2345	13. 1597
5. 3,685,044	2. 1354	14. 3069
6. 3,133,518	3. 4532	15. 6583
7. 3,336,624	4. 2165	16. 9273
8. 1,898,848	5. 1432	17. 2591
9. 3,296,936	6. 2435	18. 9378
	7. 3216	
	8. 2341	<i>C</i>
<i>B</i>	9. 3245	1. 2864
1. 574,369	10. 1324	2. 2408
2. 2,241,729	11. 2314	3. 7492
3. 1,919,526	12. 2465	4. 8945
4. 662,904	13. 7342	5. 5943
5. 765,456	14. 3705	6. 3792
6. 1,916,235	15. 1475	7. 3786
7. 5,528,937	16. 2387	8. 7015
8. 3,904,766	17. 4956	9. 5197
9. 4,794,816	18. 2861	10. 6978
		11. 7963
<i>C</i>	<i>B</i>	12. 5874
1. 1,146,530	1. 5189	13. 1643
2. 2,931,328	2. 4089	14. 4653
3. 1,024,632		

DRILL ANSWERS—*Continued*

15. 3624
16. 6456
17. 2436
18. 6354

*Division after**Review V**A*

1. 31,206
2. 41,906
3. 836,221
4. 83,751
5. 82,461
6. 15,037
7. 42,583
8. 61,472

*B*

1. 14,009
2. 83,027
3. 45,703
4. 20,688
5. 49,208
6. 63,551
7. 38,752
8. 40,879

*C*

1. 32,758
2. 91,604
3. 36,594

4. 91,703
5. 20,885
6. 37,095
7. 60,427
8. 70,992

*Addition after*  
*Review VII**A*

1. 743
2. 718
3. 691

*B*

1. 598
2. 690
3. 669

*C*

1. 787
2. 618
3. 640

*D*

1. 685
2. 811
3. 717

*E*

1. 56,144
2. 56,417
3. 42,394

*F*

1. 31,776
2. 45,388
3. 49,673

*G*

1. 37,326
2. 45,780
3. 41,023

*Multiplication after*  
*Review VIII**A*

1. 1,069,320
2. 763,656
3. 2,963,928
4. 770,740
5. 935,096
6. 1,305,160
7. 1,456,848
8. 997,266
9. 1,155,220
10. 312,464

*B*

1. 835,354
2. 653,225
3. 1,718,028
4. 1,689,480
5. 1,013,325
6. 2,184,105
7. 4,713 156

# DRILL ANSWERS—*Continued*

8. 1,484,859
9. 2,241,648
10. 2,306,196

## *C*

1. 2,240,308
2. 1,095,956
3. 3,849,728
4. 7,209,502
5. 3,164,832
6. 6,286,248
7. 2,901,912
8. 2,816,672
9. 3,799,068
10. 6,180,205

## *D*

1. 550,965
2. 1,767,744
3. 5,253,234
4. 3,375,372
5. 1,748,925
6. 4,379,526
7. 1,297,392
8. 1,820,448
9. 7,327,176
10. 4,105,755

## *E*

1. 4,689,027
2. 2,210,736
3. 2,021,724
4. 4,735,125

5. 4,661,709
6. 3,998,394
7. 3,073,718
8. 3,870,966
9. 570,121
10. 2,936,043

## *Division after Review X*

### *A*

1. 2536
2. 5654
3. 4653
4. 5643
5. 3652
6. 3564
7. 4653
8. 3605
9. 5064
10. 3264
11. 1653
12. 4635
13. 3465
14. 3426
15. 3654
16. 3654
17. 4265
18. 4362

### *B*

1. 6465
2. 5604

3. 2645
4. 2643
5. 5264
6. 3563
7. 4652
8. 3605
9. 4356
10. 5064
11. 4365
12. 4652
13. 3645
14. 4652
15. 3651
16. 2164
17. 5604
18. 3652

### *C*

1. 6254
2. 3256
3. 3265
4. 3651
5. 3465
6. 6523
7. 3625
8. 6513
9. 6534
10. 3665
11. 1665
12. 2645
13. 4652
14. 3625

DRILL ANSWERS—*Continued*

15. 3164

16. 2066

17. 2506

18. 2633

*Addition after  
Review XII**A*

1. 527,980

2. 477,603

3. 468,830

4. 533,043

*B*

1. 438,521

2. 418,736

3. 472,140

4. 527,354

*C*

1. 402,536

2. 495,808

3. 377,359

4. 483,630

*D*

1. 337,217

2. 474,323

3. 474,169

4. 611,634

*Multiplication after  
Review XIII**A*

1. 3,839,244

2. 1,963,820

3. 741,184

4. 4,766,733

5. 4,461,926

6. 3,348,232

7. 2,558,889

*B*

1. 2,893,215

2. 1,171,856

3. 1,185,856

4. 6,397,200

5. 1,155,843

6. 2,698,472

7. 4,079,424

*C*

1. 3,469,768

2. 3,591,563

3. 3,043,070

4. 3,875,452

5. 3,957,712

6. 2,523,648

7. 4,723,452

*D*

1. 1,488,522

2. 2,150,622

3. 3,001,389

4. 5,678,104

5. 3,300,578

6. 2,727,889

7. 1,361,178

*E*

1. 7,906,986

2. 4,383,573

3. 6,215,622

4. 1,343,076

5. 198,744

6. 248,292

7. 94,486

*F*

1. 248,292

2. 50,568

3. 99,517

4. 297,459

5. 53,713

6. 94,486

7. 31,275,342

*Multiplication after  
Review XIII—  
Continued**A*

8. 3,131,442

9. 4,251,085

10. 1,229,672

11. 3,766,761

12. 3,707,459

13. 5,045,928

14. 2,225,556

# DRILL ANSWERS—*Continued*

## *B*

8. 2,305,575
9. 2,791,922
10. 2,507,506
11. 2,316,492
12. 6,343,090
13. 4,774,138
14. 3,748,602

## *C*

8. 6,631,430
9. 2,076,700
10. 1,434,222
11. 3,320,326
12. 573,300
13. 1,451,208
14. 3,364,026

## *D*

8. 1,816,518
9. 3,268,356
10. 2,349,642
11. 5,767,266
12. 6,371,783
13. 3,748,626
14. 6,170,463

## *E*

8. 219,164
9. 100,992
10. 163,584
11. 101,065
12. 297,459
13. 156,915
14. 415,492

## *F*

8. 270,720
9. 72,930
10. 161,370
11. 222,924
12. 230,826
13. 394,576
14. 407,115

## *Division after Review XIV*

## *A*

1. 639,874 (+3)
2. 392,764 (+1)
3. 185,296 (+1)
4. 529,637 (+6)
5. 637,418 (+1)
6. 418,529 (+1)
7. 852,963 (+2)
8. 521,907 (+3)
9. 850,217 (+1)
10. 307,418 (+1)
11. 418,529 (+6)
12. 529,637 (+7)
13. 630,741 (+1)
14. 741,852 (+2)

## *B*

1. 74,186 (+5)
2. 41,852 (+19)
3. 63,741 (+45)
4. 30,741 (+66)
5. 56,978 (+7)
6. 65,987 (+5)

7. 85,796 (+12)
8. 97,586 (+28)
9. 53,642 (+22)
10. 48,059 (+31)
11. 34,974 (+21)
12. 48,729 (+26)
13. 51,097 (+12)
14. 24,879 (+35)

## *C*

1. 6584 (+211)
2. 7859 (+27)
3. 8795 (+22)
4. 2978. (+111)
5. 5897 (+83)
6. 8987 (+206)
7. 3798 (+31)
8. 6879 (+6)
9. 9798 (+12)
10. 4987 (+201)
11. 7789 (+2)
12. 1897 (+73)
13. 397 (+9)
14. 526 (+1)

## *Fraction Drill III*

## *Addition*

## *A*

1.  $8\frac{3}{4}$
2. 9
3.  $11\frac{1}{8}$
4.  $13\frac{1}{16}$
5.  $10\frac{1}{12}$

## DRILL ANSWERS—Continued

6.  $10\frac{11}{24}$

7.  $8\frac{2}{3}$

8.  $9\frac{4}{42}$

*B*

1.  $15\frac{1}{4}$

2.  $10\frac{3}{4}$

3.  $7\frac{1}{4}$

4.  $14\frac{7}{24}$

5.  $8\frac{1}{2}$

6.  $12\frac{11}{12}$

7.  $10\frac{8}{15}$

8.  $8\frac{3}{56}$

*C*

1.  $6\frac{5}{8}$

2. 16

3.  $11\frac{11}{16}$

4.  $14\frac{15}{16}$

5.  $12\frac{9}{10}$

6. 15

7.  $12\frac{4}{15}$

8.  $11\frac{23}{44}$

*D*

1.  $8\frac{7}{8}$

2.  $13\frac{3}{8}$

3.  $8\frac{13}{24}$

4.  $5\frac{3}{8}$

5.  $6\frac{2}{5}$

6.  $17\frac{1}{2}$

7.  $10\frac{5}{6}$

8.  $5\frac{11}{12}$

*E*

1.  $11\frac{1}{2}$

2.  $11\frac{5}{8}$

3.  $11\frac{23}{24}$

4.  $9\frac{5}{8}$

5.  $12\frac{11}{12}$

6.  $15\frac{1}{6}$

7. 7

8.  $10\frac{3}{40}$

*F*

1.  $13\frac{1}{8}$

2.  $16\frac{3}{8}$

3.  $14\frac{7}{9}$

4.  $15\frac{1}{4}$

5.  $14\frac{9}{48}$

6.  $12\frac{5}{6}$

7. 15

8.  $15\frac{9}{16}$

*Subtraction**A*

1.  $1\frac{3}{4}$

2.  $1\frac{1}{4}$

3.  $3\frac{5}{8}$

4.  $11\frac{5}{16}$

5.  $1\frac{1}{2}$

6.  $1\frac{9}{24}$

7.  $1\frac{2}{3}$

8.  $2\frac{13}{42}$

*B*

1.  $1\frac{3}{4}$

2.  $1\frac{3}{4}$

3.  $3\frac{3}{4}$

4.  $1\frac{23}{24}$

5.  $4\frac{5}{6}$

6.  $1\frac{1}{4}$

7.  $11\frac{3}{5}$

8.  $1\frac{39}{56}$

*C*

1.  $1\frac{5}{8}$

2.  $4\frac{3}{4}$

3.  $4\frac{11}{16}$

4.  $3\frac{7}{16}$

5.  $1\frac{3}{10}$

6.  $1\frac{2}{3}$

7.  $3\frac{1}{15}$

8.  $2\frac{9}{24}$

*D*

1.  $1\frac{7}{8}$

2.  $1\frac{5}{8}$

3.  $1\frac{9}{24}$

4.  $2\frac{7}{8}$

5.  $\frac{3}{5}$

6.  $1\frac{5}{12}$

7.  $5\frac{5}{8}$

8.  $2\frac{3}{4}$

*E*

1.  $1\frac{3}{4}$

2.  $5\frac{7}{8}$

3.  $2\frac{7}{44}$

4.  $2\frac{7}{8}$

5.  $1\frac{7}{12}$

6.  $1\frac{5}{6}$

7.  $1\frac{1}{2}$

8.  $2\frac{37}{40}$

*F*

1.  $3\frac{7}{8}$

2.  $2\frac{7}{8}$

3.  $1\frac{4}{9}$

4.  $1\frac{1}{2}$

5.  $4\frac{35}{48}$

6.  $1\frac{5}{6}$

7.  $3\frac{2}{5}$

8.  $3\frac{13}{16}$









